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PRELIMINARY ASSESSMENT REPORT

for

ALEXANDRIA MUNICIPAL WELL CONTAMINATION SITE

Alexandria, Douglas County, Minnesota

MPCA Site Assessment Site: SA247
EPA ID: MNN000505797

Prepared by:

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September 28, 2018

MINNESOTA POLLUTION CONTROL AGENCY

Signature Page
for

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MINNESOTA POLLUTION CONTROL AGENCY

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1.0 INTRODUCTION

The Site Assessment Program of the Minnesota Pollution Control Agency (MPCA), under a Cooperative Agreement with the United States Environmental Protection Agency (EPA), has prepared this Preliminary Assessment Report (PA) under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, 40 CFR, Part 300) for the Alexandria Municipal Well Contamination Site in Alexandria, Minnesota. The purpose of the PA is to distinguish between sites that pose little or no risk to human health and the environment and sites that require further investigation. If, over the course of the investigation, there is sufficient information to suggest the site is impacting human health or the environment, the site can be placed in the SEMS database and will progress through the Superfund pre-remedial investigative process.

The MPCA was given approval by the EPA to conduct a PA at the Alexandria Municipal Well Contamination Site (Site) based on the results of a Pre-CERCLIS Screening worksheet (PCS) that was prepared for this site (MPCA, 2015). The PCS identified petroleum and non-petroleum contamination including chlorinated volatile organic compounds (CVOC) in multiple City of Alexandria municipal supply wells including municipal wells Mu4 and Mu6a which were located in the south well field and municipal wells Mu7a and Mu8a located in the north well field (see **Figure 1** for well field locations). Wells Mu4 and Mu6a (located in the south well field) were abandoned and sealed due to the presence of these contaminants. The initial site location was identified as the south well field area, which is generally located at the intersection of Broadway Street and 3rd Avenue West. The north well field area (**Figure 2**) is now the focus of site investigation activities due to the presence of contamination identified in municipal wells Mu7a and Mu8a and the sealing of the municipal supply wells located in the south well field.

Chlorinated volatile organics identified in well Mu7a include: trichloroethene (TCE), *cis*-1,2-dichloroethene (*c*DCE), 1,2-dichloroethane (DCA) and 1,4-dichlorobenzene. Chlorinated VOC detected in well Mu8A include: TCE, *c*DCE and 1,2-DCA. Raw water concentrations of TCE from wells Mu7a and Mu8a have exceeded the Minnesota Department of Health (MDH) Health Risk Limit (HRL) for this compound (0.4 µg/L), but have not yet

exceeded the EPA Maximum Contaminant Level (MCL, 5 µg/L). However, finished drinking water samples collected by MDH have not detected the presence of chlorinated compounds above the HRL.

Potential sources of chlorinated solvent contamination typically include dry cleaning, metal finishing, degreasing operations, mechanical maintenance, and other industrial facilities. Information contained in this report will be used to evaluate this site to support a site decision regarding the need for further Superfund action, including the possibility for the site to be considered for inclusion on the National Priorities List (NPL) of hazardous waste sites.

This report contains the text, figures and data tables discussed. The appendix references throughout the text refer the reader to a particular appendix within a specific report that contains the referred information. Previous report documents referred to in this report will be submitted as companion documents to this Preliminary Assessment Report.

2.0 SITE BACKGROUND

2.1 Site Location and Description

The Site is in the City of Alexandria, which is the county seat for Douglas County, Minnesota. The village of Alexandria was incorporated in 1877; its city charter was adopted in 1908; and it was incorporated as a city in 1909. The 2010 census indicated a population of 11,070. The original site location, as stated in the Pre-CERCLA Screening Assessment (PCS), consisted of the south well field area located at the intersection of Broadway Avenue and 3rd Street west. The south well field was abandoned in the 1990's due to petroleum and chlorinated solvent contamination in several of the wells. The north well field is now the primary municipal water supply source for the City of Alexandria. The site location illustrated on **Figure 1** represents a point in the north well field that is located halfway between municipal supply wells Mu7a and Mu8a as these are the two wells in the north well field where trichloroethene (TCE) contamination has been identified. This site location is the reference point from which the potential exposure pathways were evaluated for the site.

The north well field currently consists of nine active municipal supply wells including; Mu7a, Mu8a, Mu9, Mu14, Mu16, Mu17, Mu18, Mu19 and Mu20. Municipal supply well Mu7a is located inside a pump house approximately 200 feet west of the intersection of North Nokomis Street and Kenwood Drive. Municipal well Mu8a is located inside a pump house approximately 100 feet northeast of the intersection of North Nokomis

Street and Carlos Avenue. Approximate municipal well locations are illustrated on **Figure 3**. MDH well and boring records for the north well field municipal supply wells are attached in **Appendix A**.

Land use in the vicinity of the site consists of mixed commercial and residential properties. The site elevation is approximately 1,400 feet above mean sea level. Site topography is relatively flat and level. The nearest surface water body to the site is Lake Agnes which is approximately 500 feet southwest of the site. The site is not located within a 100 year or 500 year flood plain area (see **Figure 4**).

Surficial/Quaternary Geology

Surficial geology in the vicinity of the Site includes Des Moines lobe outwash undivided as to moraine association of the late Wisconsinan glacial stage consisting of clayey sand and gravel (Hobbs, *et. al.*, 1982). The upper most sand unit in the area varies between approximately 20 to 40 feet thick and begins anywhere from the ground surface to approximately 15 feet below ground surface. A clay-rich unit is generally present in the north well field area between approximately 35 feet to 90 feet below ground surface.

Bedrock Geology

The uppermost bedrock underlying the site area consists of undifferentiated Precambrian igneous and metamorphic rock. Late Archean rock types include felsic to intermediate volcanic and volcaniclastic rocks, mica schist, phylite and granitic rocks (Morey, 1994). The depth to bedrock in the Alexandria area ranges from approximately 270 to 300 feet (Olsen and Mossier, 1982).

Surface Hydrology

The City of Alexandria is surrounded by numerous lakes that come together to form the headwaters to the Long Prairie River. Lake Agnes is the closest lake to the site, located approximately 500 feet to the southwest.

Hydrogeology

The primary resource aquifer in the area is a Quaternary buried aquifer consisting of a deep sand unit between 25-45 feet thick and ranging between approximately 90-120 feet below ground surface in the vicinity of the north well field. A clay-rich unit of the Des Moines Lobe till overlies the deeper sand unit and contains sand and gravel lenses. This clay unit of Des Moines Lobe till likely provides some confinement between the shallow and deep Quaternary aquifers; however, the available geologic data does not provide a clear picture of the full relationship between the two aquifers. The presence of tritium in groundwater indicates the water entered the aquifer from the surface sometime after 1953 (beginning of atmospheric thermonuclear testing). Tritium testing results for samples collected from Alexandria Wells Mu7A, Mu8A,

and Mu12 indicate that this water is young, having entered the aquifer after 1953. These results combined with the presence of contamination in the deep Quaternary aquifer indicates that there is communication between the shallow and deep Quaternary aquifers in the area and that the aquifers are vulnerable to contamination from surficial sources (ALP, 2013).

Depth to groundwater in the deeper Quaternary buried aquifer (resource aquifer) is approximately 30 to 35 feet below ground surface. Depth to groundwater in the shallow Quaternary water table aquifer ranges between 10 to 30 feet below ground surface. The groundwater gradient in the Quaternary water table aquifer and Quaternary buried aquifer in the vicinity of the site is generally towards the north to northeast.

The Precambrian igneous and metamorphic bedrock in the area is generally not considered a viable aquifer, except in faulted zones (Kanivetsky, 1979).

2.2 Site History

The City of Alexandria has historically obtained municipal drinking water from two well fields, including the south well field and the north well field (see **Figure 1**). The municipal supply wells in these well fields are generally set in the deep sand/drinking water aquifer at depths of approximately 90 to 120 feet below ground surface (bgs). The south well field was first developed in the 1920s; however, it is no longer in use and all of the municipal wells in the south well field have been sealed/abandoned. The north well field was first developed beginning in 1948 and currently provides drinking water to the City of Alexandria. The north well field contains nine currently active wells, installed between 1957 and 2016. 1,2-Dichloroethane (1,2-DCA) and benzene were first detected in municipal wells beginning in 1984. In response to the identified impacts, a petroleum release was reported to the MPCA on July 1, 1985 and the site was assigned Leak #114 (also referred to as “Alexandria Well Field Contamination Site”). In addition to benzene and 1,2-DCA, the trichloroethene (TCE) was also identified in several municipal supply wells located in the south well field along with municipal well Mu7a, which is located in the north well field.

MDH approved a Wellhead Protection Plan (WHPP) for Alexandria on June 25, 2003 to help protect Alexandria’s municipal wells from further contamination. On September 9, 2013, MDH approved an amendment to the WHPP (included as Appendix B). Alexandria is currently working to implement the amended WHPP. The WHPP addressed the delineations of the groundwater capture zones and a vulnerability assessment for existing water

supply wells. The amended WHPP delineated the Wellhead Protection Area (WPA) and Drinking Water Supply Management Area (DWSMA) and evaluated the vulnerability of the wells and the vulnerability status of the aquifer in which the City's wells are located. A DWSMA is an MDH-approved surface and subsurface area surrounding a public water supply well that completely contains the scientifically calculated wellhead protection areas and is managed by the entity identified in a wellhead protection plan.

The north well field is located in the northeastern portion of the City of Alexandria and hydraulically down-gradient of historic and current commercial/industrial areas of the City where past site usages may have resulted in the release of VOC contamination.

2.3 Previous Environmental Investigations

Previous environmental investigation work for the City of Alexandria municipal well fields was completed under the MPCA's Petroleum Remediation Program (PRP) under Leak Site 114. The PRP investigation work identified TCE contamination at locations up-gradient of the north well field within the resource aquifer at similar concentrations to those identified in municipal wells Mu7a and Mu8a. However, the PRP investigations did not identify any significant shallow source of CVOC that might indicate a release source area. The current Site Assessment actions have been initiated in response to routine MDH sampling results the results of the Phase I ESA that identified multiple potential historic recognized environmental conditions that could have resulted in contamination.

3.0 SITE ASSESSMENT ACTIVITIES

MPCA conducted an area-wide Phase I Environmental Site Assessment (Phase I ESA) for the Alexandria Municipal Supply Well TCE Site, in Alexandria, Minnesota (Site) to further assess potential CVOC sources in the area in late 2015 and early 2016 (Braun, 2016). Specifically, the Phase I ESA activities attempted to identify potential CVOC sources in the vicinity of the north well field location and provide guidance for determining potential source locations for successive investigation phases.

A summary of the Phase I ESA findings are presented below:

- The City of Alexandria has historically obtained municipal drinking water from two well fields, including the South Well Field and the North Well Field. The wells in these well fields are generally set in the Quaternary deep sand and gravel aquifer at depths of approximately 90 to 120 feet bgs.

- Contamination of the Alexandria municipal wells was first detected in 1984 in the South Well Field. Petroleum hydrocarbons (notably benzene and 1,2-dichloroethane (1,2-DCA)) were detected in the deep sand and gravel aquifer. These detections were reported to the MPCA in 1985 and the site was assigned petroleum leak site LEAK#114 (also referred to as "Alexandria Well Field Contamination Site").
- Further investigation has identified chlorinated VOC impacts in multiple wells, including four municipal supply wells (Wells 4, 6A, 7A, and 8A) and two private wells; Christopherson's Bait and Erickson Towing (see **Figure 3 and Table 2**). Chlorinated VOC have also been identified in deep monitoring wells upgradient of the north well field (i.e. MW-2D on **Figure 3 and Table 2**).
- Because of the contamination detected in Wells 4 and 6A, the City elected to abandon and seal these wells in 1998. These were the last two remaining active wells in the South Well Field.
- Five of the municipal wells within the North Well Field presently in use (Mu8a, Mu12, Mu13, Mu14, and Mu20) draw water from a deep sand deposits with the top of sand ranging anywhere from 87 to 119 feet bgs. This "deep aquifer" is between 25 and 45 feet thick and has historically been presumed to be confined by clay-rich strata present above and below the sand unit. The remaining two active municipal wells (Mu7A & Mu9) are assumed to draw water from the same "deep aquifer" but there is no geologic log to confirm this.
- Groundwater in the Study Area occurs within the shallow soil deposits and deeper buried sand deposits. The depth to the water table in the shallow soil deposits ranges from 10 to 30 feet bgs. The water level in wells completed within the deep buried sand deposits/aquifer ranges from 30 to 40 feet bgs. The direction of both the shallow and deep groundwater flow within the Study Area is variable due to the proximity of Lake Agnes and other surface water bodies, and is presumably affected by pumping from the deep water wells. Water level measurements from monitoring wells at several petroleum release sites adjacent to Lake Agnes have documented shallow groundwater flow ranging from northwest to east.
- Investigation reports prepared for LEAK#114 have concluded that the geologic data available for municipal wells and deep monitoring wells does not provide a clear picture of the relationship between the shallow and deep aquifers. The uniformity of the clay till confining layer which separates the shallow and deep aquifers is unknown. Gaps or inconsistencies in the confining layer would allow surface contamination into the deep aquifer. The deep aquifer is recharged by leakage through the confining layer, but the extent, rate, and proximity to contaminant sources is unknown.
- The Study Area, which is wholly contained within the Alexandria Wellhead Protection Area (WPA) and Drinking Water Supply Management Area (DWSMA), is characterized by existing and historical retail/commercial facilities including gasoline stations/convenience stores, machine shops, automobile service/repair businesses, and dry cleaners; a bulk petroleum storage facility; residential properties; railroad tracks; and undeveloped parcels. Magellan Midstream Partners operates a regional petroleum products pipeline terminal approximately one mile west of the site, across Lake Agnes (Magellan Pipeline Co LP – Alexandria Terminal, MND000824094, https://cf.pca.state.mn.us/wimn/siteInfo.cfm?siteid=2181).
- At least ten historic or current dry cleaners were identified within the Study Area. No documented sampling/testing appears to have been completed in association with the remaining ten identified historic or current dry cleaner sites.
- Seventy-five historic or current gasoline/service stations were identified within the Study Area. No documented sampling/testing appears to have been completed at 52 of these facilities.
- Study Area Site #71 - groundwater sampling in 2005 detected PCE at a concentration of 180 ug/L, TCE at 5.9 ug/L and vinyl chloride at 1.5 ug/L. Site #71 was formerly operated as a flour mill, feed mill, commercial

garage, and gasoline service station at one time or another in the past. In addition, it is located in the vicinity of several historic cleaners, including Sites #68, #69, and #83.

4.0 PRELIMINARY EXPOSURE PATHWAY ASSESSMENT

As part of this preliminary assessment process, potential exposure pathways were evaluated for the site, based on available information. The pathways evaluated include air exposure, soil exposure, surface water, groundwater, and drinking water. The City of Alexandria North Well Field is located in a mixed residential and commercial area. Public access to the site and nearby properties is not restricted. Public access to the buildings is limited by locked doors.

This site was discovered as a result of monitoring receptors (municipal supply wells) for contaminants. Potential source areas for the contamination detected in the municipal supply wells have not yet been identified. It is possible that source areas do exist that may have residual soil contamination present.

4.1 Air Exposure Pathway

Direct human exposure to airborne contaminants resulting from the groundwater contamination under investigation at this site has not been evaluated at this time. Nor has the potential for airborne contaminants resulting from the groundwater contamination to impact ecological receptors been evaluated at this time. No sources have been identified to evaluate at this time. Further assessment of the air exposure pathway may be conducted in the future.

4.2 Soil Exposure Pathway

Exposure to soil-borne contaminants is often a concern, particularly for sensitive receptors located within the one-mile target distance limit (TDL). Using data provided by the Minnesota Department of Education and the Minnesota Department of Human Services (**Table 4-1**, below), locations of registered school facilities and licensed day care facilities within the 1-mile TDL were mapped and evaluated (**Figure 5).** Similarly, using data provided by the Minnesota Department of Natural Resources, potential for sensitive ecological receptors was evaluated and mapped (**Figure 6).**

4.2.1 Direct Soil Contact

The North Wellfield area is located within a mixed residential and commercial neighborhood. This neighborhood consists of single-family and multiple-family residences along with a variety of commercial properties of all types. It is not clear how many people live in this neighborhood, or how many are children. There is one day care facility located within ¼ mile of the site, and 26 located within one-mile of the site (**Table 4-1** below). There are no schools located within ¼ mile of the site, but there are 6 schools located within one mile of the site. However, because no sources have been identified, it is difficult to predict the potential for direct soil exposure to residential and/or sensitive receptors.

Table 4-1: Potential Receptors Located Within 1 – and 4 – Mile Target Distance Limits

Distance from Site	Population Within Distance Zones	Licensed Day Care Facilities	Schools	Municipal Water Supply Wells	Commercial/ Industrial/ Irrigation Supply Wells	Food/ Beverage/ Processing Wells	Domestic Supply Wells	Non-Community Public Supply Wells
0 to ¼ mile	283	1	0	10	0	0	1	0
¼ to ½ mile	585	1	3	1	0	0	2	5
½ mile to 1 mile	2,043	26	3	0	7	6	52	9
1 mile to 2 miles	5,375	NA	NA	0	5	1	257	24
2 miles to 3 miles	5,061	NA	NA	0	6	0	218	22
3 miles to 4 miles	3,589	NA	NA	2	5	0	206	10
Totals	16,936	28	6	13	23	7	736	70

- Populations developed from 2010 US Census block group data.
- School facilities developed from Minnesota Department of Education data.
- Day Care facilities developed from Minnesota Department of Human Services data.
- Well information derived from Minnesota Department of Health Minnesota Well Index data.
  - Municipal Water Supply Wells include water supply wells that supply drinking water to for a municipally operated water supply system.
  - Commercial/Industrial/Irrigation Supply Wells include those wells registered for use as process water, heating/cooling water, agricultural and recreational irrigation wells.
  - Food/Beverage Processing wells are wells identified by well name in the CWI as potentially being used for food & beverage production/processing and irrigation of food crops.
  - Domestic Supply Wells are wells that supply drinking water to one or a few individual homes and are not considered "public supply wells."
  - Non-Community Public Supply Wells are wells that provide potable water for occupants of the facility that are not residents. An example would be a school that is not connected to municipal supply but instead has one or more water supply wells.

4.2.2 Subsurface Intrusion

Low concentrations of volatile organics have been observed in the groundwater at levels of regulatory concern. However, the extent and magnitude of groundwater contamination has not yet been determined. Nor has the location of potential source areas for the contamination. Because the contamination detected so far has been relatively diffuse, there has been little or no subsurface intrusion assessment work conducted at this site. However, the Phase I ESA identified a number of locations where past commercial uses may indicate the potential use of organic solvents. These locations are currently being evaluated relative to their potential for subsurface intrusion potential.

4.3 Surface Water Pathway

Lake Agnes lies less than 500 feet west of the North Wellfield. Lake Agnes is one of a series of lakes in the area that come together to form the headwaters to the Long Prairie River. The Long Prairie River flows to the northeast from the site as a tributary to the Crow Wing River which is part of the Mississippi River watershed. In addition, there are several other named and unnamed surface water bodies lying adjacent to or nearby the North Wellfield. The nearest surface water body is a 2.2 acre unnamed pond that lies along the northwest edge of the North Wellfield area (**Figures 1 and 2**).

4.3.1 Environmental Exposure Potential

It is assumed that stormwater from the North Well Field area drains to the west, into Lake Agnes. From Lake Agnes, water flows toward the north, into Lake Henry, through an unnamed stream into Le Homme Dieu, into Lake Carlos and the Long Prairie River drainage. From the POE in Lake Agnes, the 15-mile downstream target distance limit (TDL) from the site through the lakes and into the Long Prairie River was evaluated for potential ecological receptors. **Figure 6** displays pertinent geographic data available from Federal and State sources.

Outside the City of Alexandria along the downstream TDL, the land use is dominated by grasslands and agricultural lands. There are extensive wetland areas throughout this area. However, at the map scale sufficient to show the 15-mile downstream TDL, the wetland areas are not plotted. Quantification of wetland areas is beyond the scope of the PA. There are a number of MDNR Native Plant Communities and MDNR Natural Heritage areas (unique or critical habitat areas) that lie within the 15-mile downstream TDL. These Natural Heritage Areas include habitat areas for the bald eagle, osprey, and other threatened and endangered species. Quantification of the environmental exposure threat is beyond the scope of this PA report. However,

based on the low observed contaminant concentrations observed in the surficial soils at the site, it is not anticipated that there would be a significant site-specific threat of environmental exposures to these identified ecological receptors.

4.3.2 Direct Human Contact Exposure Potential

Most of the lakes and streams along the downstream TDL are heavily used for recreational activities. This includes boating, water skiing, swimming, fishing, etc. Because the source of the contamination present in the Alexandria wells has not yet been determined, it is not clear what kind of exposure risk is present at this time. It is likely that incidental exposures related to skin contact with surface water have a low potential for harmful exposures. However, recreational fishing provides a large proportion of the protein in many family's diets in the region. What the potential for significant exposure via the human food chain is at this site is unknown. Quantifying the potential for such exposure is beyond the scope of the PA.

4.3.3 Surface Water Drinking Water

The City of Alexandria provides drinking water through a municipal system for residents of the City. The source of water for this system is groundwater, not surface water. Similarly, there are no surface water drinking water intakes along the downstream TDL from the POE (**Figure 7**). Thus, the potential for human exposure via drinking water sourced from surface water is negligible at this site.

4.4 Groundwater Pathway

Groundwater in this area lies at a depth of less than 30 feet in most areas. Surficial deposits generally consist of relatively thin, glacially derived topsoil, underlain by sand and gravel outwash deposits with significant fine-grained till lenses being present. The sand and gravel glacial aquifer ranges to depths as great as 300 feet in places and is underlain by igneous and metamorphic rock. The glacial deposits are capable of producing vast quantities of high quality groundwater, but are also considered to be vulnerable to contamination from the surface.

The locations and status of groundwater wells is determined using the Minnesota Well Index (MWI) database online (http://www.health.state.mn.us/divs/eh/cwi/). The MWI database contains the records of registered wells only. Wells that pre-date (1974) the registration process may not be reflected in the database. The CWI does not always indicate the current status of the wells. Some have been abandoned, some sealed, and it is

likely that some are still in use. Determining the current usage status, and hence, the potential for contaminant exposure, of these wells was beyond the scope of this assessment.

4.4.1 Groundwater – Surface Water Interaction & Environmental Exposure Potential

The close proximity of the lakes and shallow groundwater indicate that there could be significant interaction between groundwater and surface water. However, this has not been examined in the area in detail and thus there is no relevant data regarding the potential for contaminated groundwater from the site interacting with surface waters and causing a situation where the exposure potential to human or ecological receptors has been explored.

4.4.2 Groundwater – Drinking Water

Groundwater contamination of the glacial aquifer has been detected in both of the City of Alexandria's municipal well fields. The South Wellfield was located south of Lake Agnes (**Figure 1**), near the intersection of Broadway St. (MN Hwy 29) and 3rd Ave. E (County Hwy 82). The North Wellfield is located approximately ¾ mile northeast of the South Wellfield, northeast of Lake Agnes, near the intersection of N. Nokomis St. (MN Hwy 29) and Carlos Ave. Regional groundwater gradient is relatively slight, with flow generally toward the east but highly variable.

Municipal Water Supply

US Census data (2010) indicate that approximately 17,000 people live within 4 miles of the site (**Figure 8, Table 4-1**, above. The City of Alexandria provides potable drinking water to a municipal population of over 13,340 according to the MDH Source Water Assessment (SWA). The City draws its water from groundwater, using a network of 9 wells located in its North Municipal Wellfield ranging in depth from 116 to 135 feet (**Table 4-2**). The wellhead protection area (WPHA) for these wells lies entirely within the 4 mile TDL (**Figure 9**). Historically, the City also obtained groundwater from its South Wellfield, but that wellfield was closed, and the wells abandoned, because of persistent groundwater contamination.

The source(s) of the contamination identified in the municipal wells has not been identified. In addition, the extent and magnitude of the groundwater contamination observed has not been determined. The concentration of contaminants present in municipal well raw water samples has generally been relatively low (above the MDH HRL to just over the MCL for TCE, see **Table 1**) and currently is blended with water from wells not showing contamination, providing finished water with no detectable TCE.

Table 4-2: City of Alexandria North Well Field Summary Table

Facility Name	Unique Well No.[1]	Depth (ft)	Use	Source	Source vulnerability
Well #7A	214756	129	Primary	Glacial deposit	Vulnerable
Well #8A	214758	119	Primary	Glacial deposit	Vulnerable
Well #9	214759	118	Primary	Glacial deposit	Vulnerable
Well #14	680655	126	Primary	Glacial deposit	Vulnerable
Well #16	749302	120	Primary	Glacial deposit	Vulnerable
Well #17	762288	135	Primary	Glacial deposit	Vulnerable
Well #18	791566	120	Primary	Glacial deposit	Vulnerable
Well #19	810340	116	Primary	Glacial deposit	Not vulnerable
Well #20	821203	133	Primary	Glacial deposit	Not vulnerable

[1] link(s) to Minnesota Well Index database

Currently the potential for exposure to significant levels of TCE via the municipal drinking water pathway appears to be quite low. However, because neither the extent & magnitude of the contamination nor the source of the contamination is known, it is not possible to predict how long that will remain the case.

Non-Community Public Supply Wells

Public supply wells that do not provide water to a municipal system are considered non-community public supply wells. These wells typically provide water at facilities such as schools, shopping centers, large employers, etc. There are no non-community public supply wells located within ¼ mile of the site (**Table 4-1, above**). However, there are 70 non-community public supply wells within the TDL. The potential for exposure to contamination released at this site through non-community public supply wells within the TDL is not known. The population served by each of these wells is not currently known; and the determination of the population served by each of these wells is beyond the scope of this PA.

Commercial/Industrial and Food/Beverage Processing Wells

There are a substantial number of commercial and/or industrial water supply wells located within the TDL (**Table 4-1**). There are none located within ½ mile of the site. There are a total of 23 commercial/industrial/irrigation wells within the TDL, and 7 of these appear to be related to food and/or beverage processing (or otherwise involved within the human food chain). The potential for human exposure

to VOC released at the site as a result of commercial industrial and food/beverage processing wells is not known.

Domestic Wells

Water supply wells registered as "domestic" supply wells provide water to private residences. There are 736 registered domestic supply wells within the TDL. Domestic wells installed before about 1974 were not required to be registered. Fifty-five of the registered domestic wells lie within one mile of the site (**Table 4-1, Figure 10**). It is not clear how many of these domestic wells are located at residences served by municipal water. The City has an active well abandonment program where the cost for a resident to abandon and seal a well within the water utility service area is covered by the water utility. Those residences that have municipal water supply and domestic wells typically do not use the wells for potable use, but there is nothing prohibiting their use as domestic supply wells. The potential for human exposure to groundwater contamination resulting from this site via domestic wells is unknown.

5.0 CONCLUSIONS

The resource aquifer utilized by the City of Alexandria for municipal water has been impacted by CVOCs including TCE and 1,2-DCA as well as petroleum VOCs. These compounds have been detected in municipal wells Mu7a and Mu8a located in the north well field. Previous site investigation work indicates numerous potential petroleum sources in the area; however, a definitive CVOC source for the groundwater impacts has not been identified.

In addition, the full extent and magnitude of groundwater contamination that is affecting the municipal wells has not been determined. MPCA is conducting Phase II ESAs including soil, soil-gas and groundwater testing at several up-gradient sites to evaluate potential CVOC source areas. MDH is conducting ongoing monitoring of the north well field municipal wells and the finished drinking water.

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WCEC, 2017, Annual Monitoring Report Form, MPCA Guidance Document 4-08, Alexandria Wellfield Contamination, Douglas County Minnesota, MPCA Site ID: LEAK00000114, dated May 12, 2017, prepared under contract for Minnesota Pollution Control Agency Petroleum Remediation Program, 181 pp.

Figures

MINNESOTA POLLUTION CONTROL AGENCY

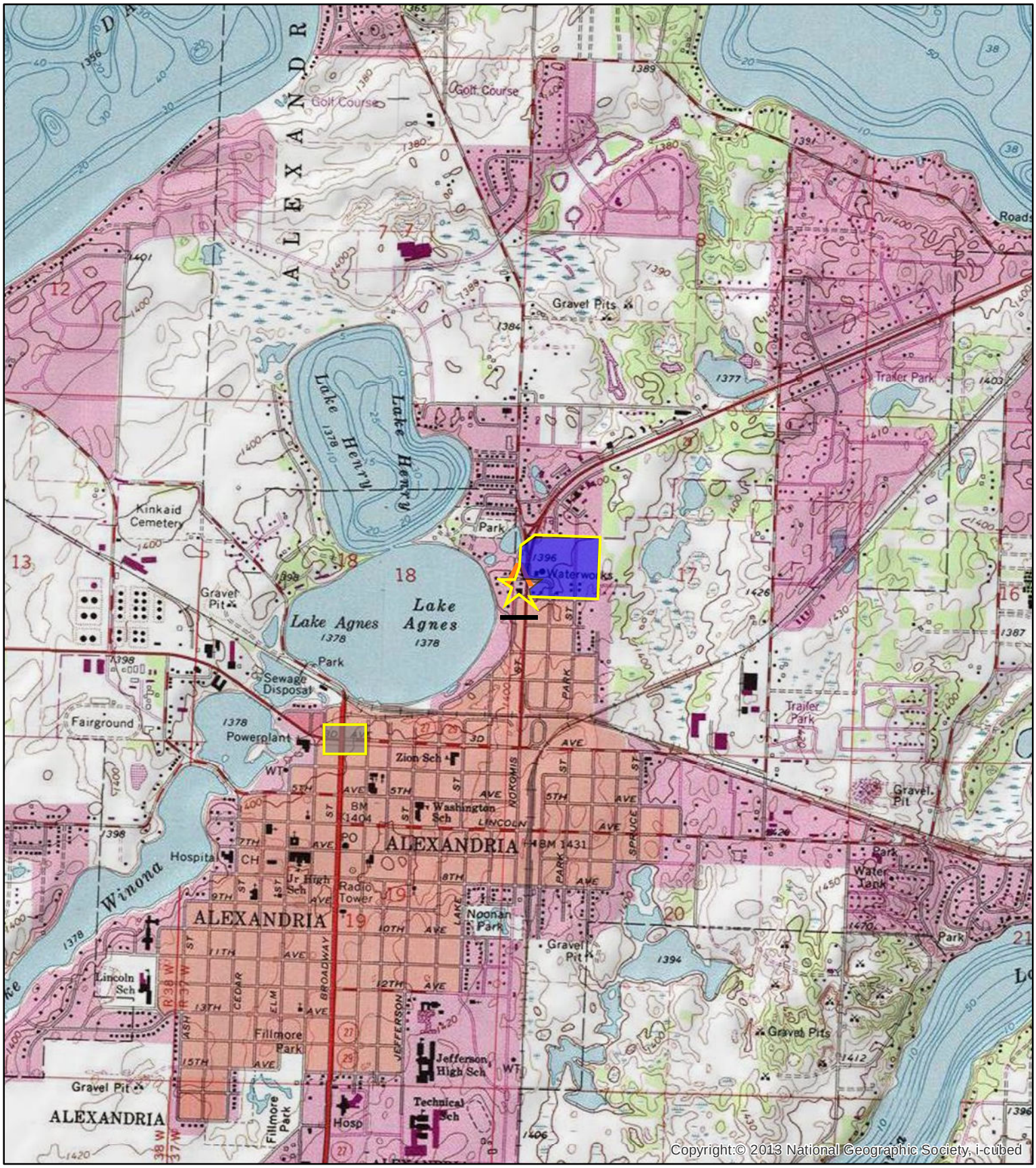
Figure 1
Site Location
Alexandria Wells
Alexandria, MN
MPCA Site Assessment Program Site SA0000247

Site area

North well field (active)

South well field (abandoned)

0 0.225 0.45 0.9 Miles

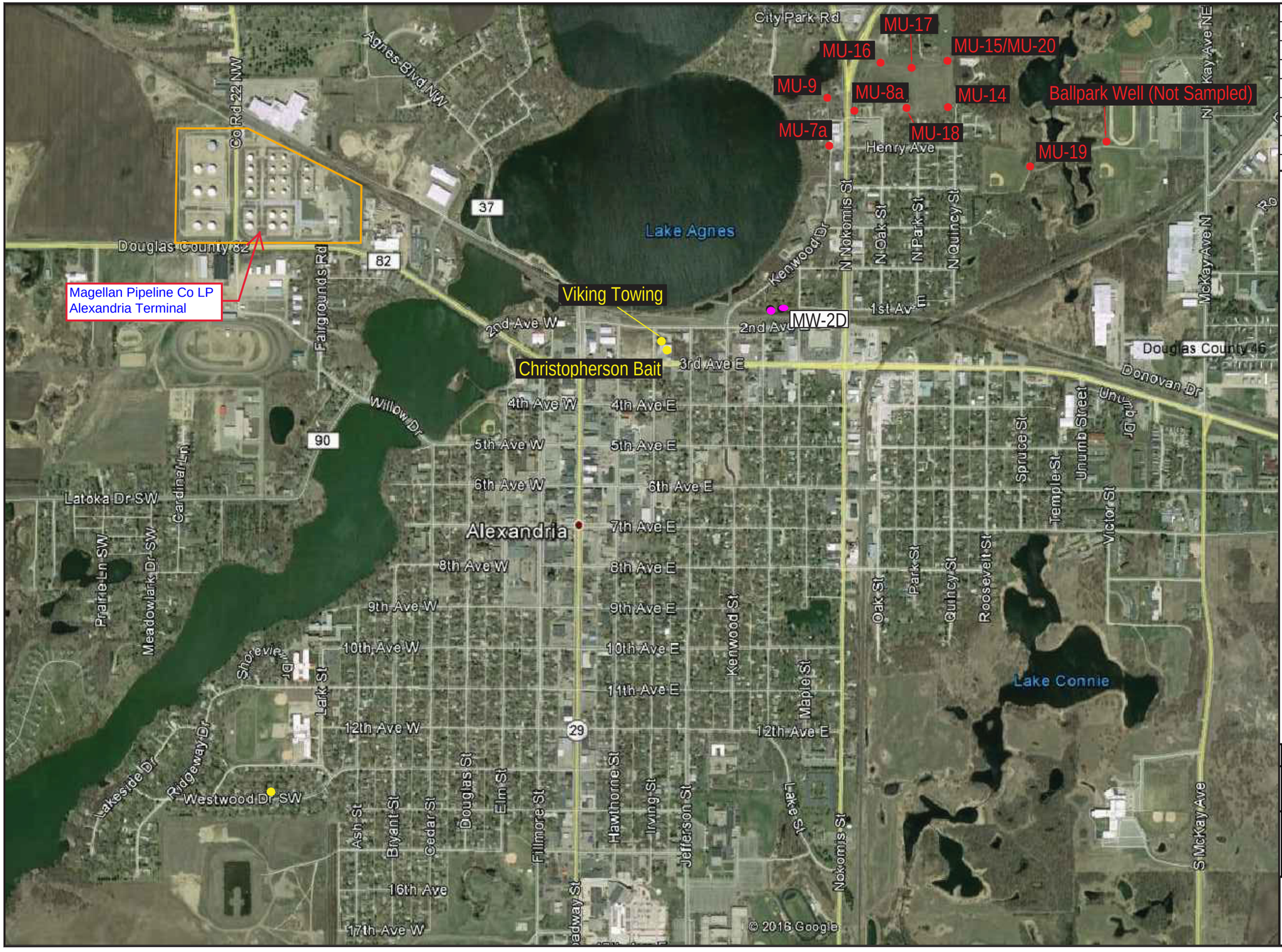


MINNESOTA POLLUTION CONTROL AGENCY

Figure 2
North Well Field Vicinity
Alexandria Wells
Alexandria, MN
MPCA Site Assessment Program Site SA0000247

Approximate location of North well field

0 0.045 0.09 0.18 Miles



Rev.	By	Description

KEY

- Municipal Wells
- Private/Buisness Wells
- Monitoring Well

Original base map and well locations provided by WCEC Environmental Consultants,

500' 0 1000'

SCALE 1" = 1000'

N

Figure 3
Well Locations

Alexandrial Wells Site
Alexandria, MN
MPCA SA Site SA0000247

MINNESOTA POLLUTION CONTROL AGENCY

Figure 4
Site Vicinity Flood Plain Location
Alexandria Wells
Alexandria, MN
MPCA Site Assessment Program Site SA0000247

MINNESOTA POLLUTION CONTROL AGENCY

Flood plain areas (FEMA Q3)

100 year (0)

500 year (0)

Date: 11/17/2017

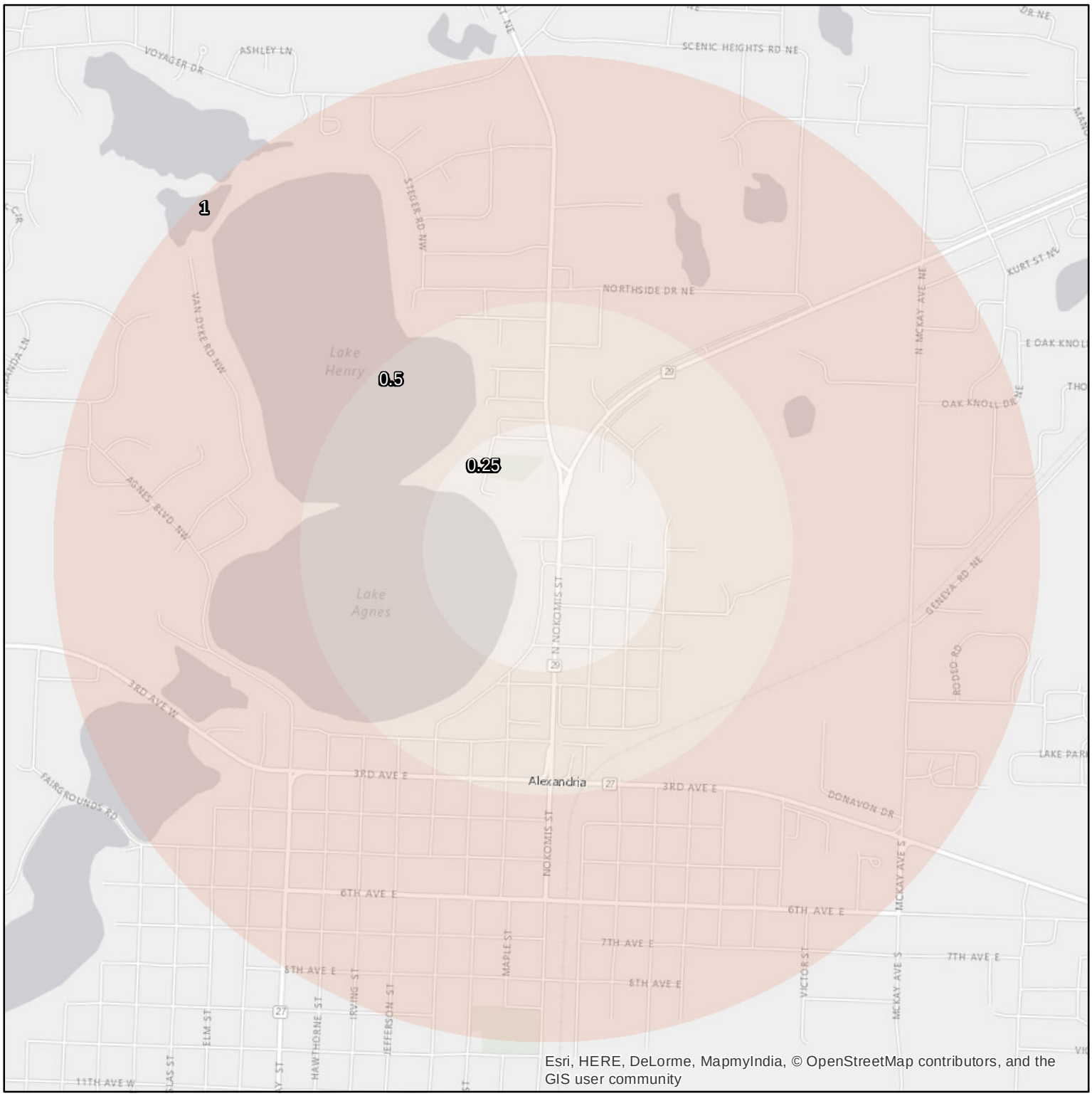


Figure 5
Potential Receptor Assessment: Schools and Registered Day Care Facilities Within 4-Mile TDL
Alexandria Wells
Alexandria, MN
MPCA Site Assessment Program Site SA0000247

MINNESOTA POLLUTION CONTROL AGENCY

! Schools in the buffer area

" Daycares in the buffer area

Date: 11/17/2017

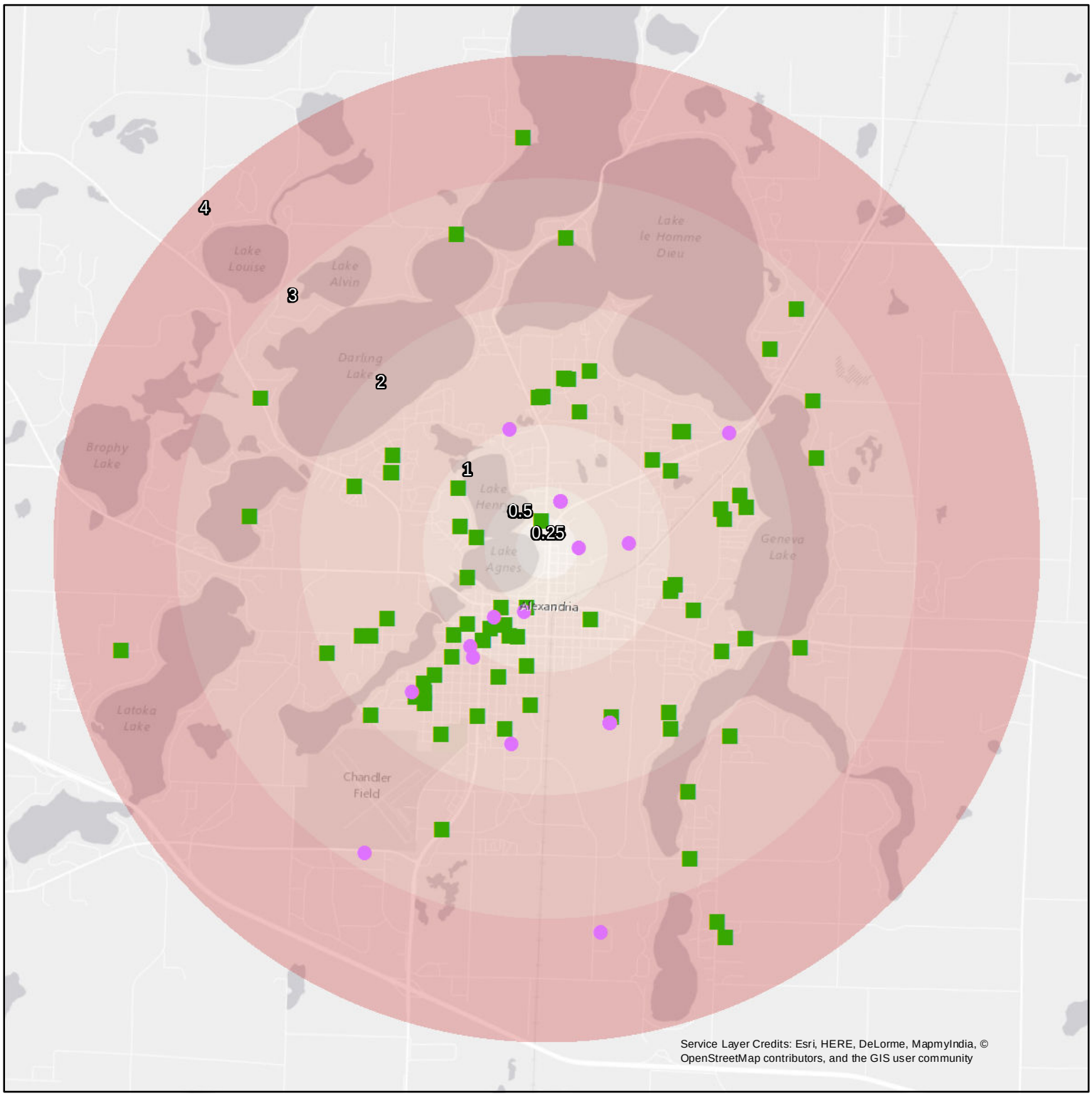


Figure 6

Potential Sensitive Receptors: Ecological Receptors Within 15-Mile Downstream TDL

Alexandria Municipal Well Contamination
Alexandria, Douglas County
MPCA Site SA247

MINNESOTA POLLUTION CONTROL AGENCY

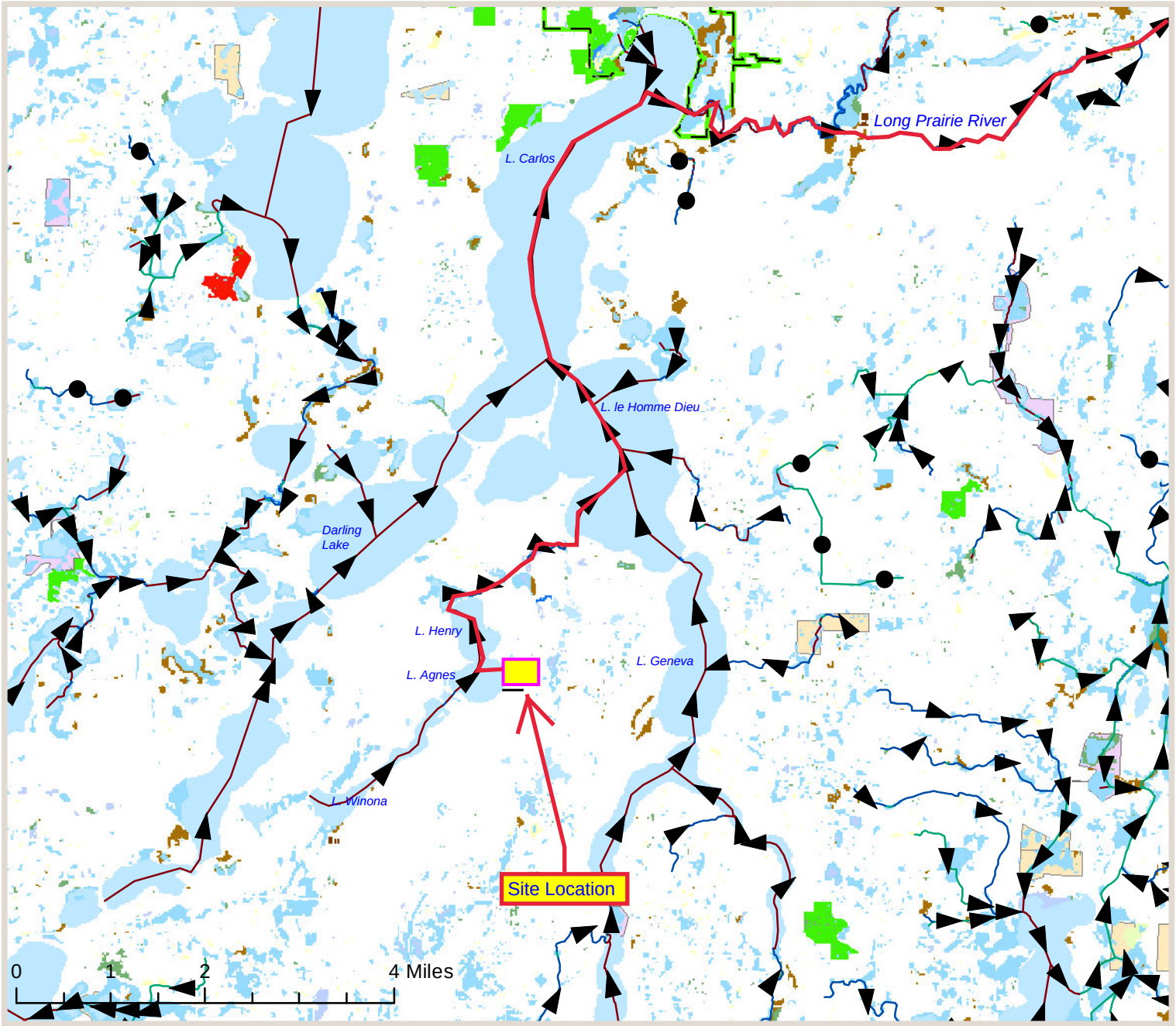
Site (1)

NHD Flowlines
- ArtificialPath (153)
- CanalDitch (54)
- Connector (46)
- StreamRiver (101)

National Wetlands Inventory Raster
NWI Circular 39 Classification
- Seasonally Flooded Basin or Flat
- Wet Meadow
- Shallow Marsh
- Deep Marsh
- Shallow Open Water
- Shrub Swamp
- Wooded Swamp
- Municipal and Industrial
- Riverine System
- Waterfowl Production Areas (6)
- Wildlife Mgmt Areas - Public Accessible (6)
- State Park (1)

DNR Native Plant Communities
- Fire-Dependent Forest/Woodland System (1)
- Forested Rich Peatland System (2)
- Marsh System (7)
- Mesic Hardwood Forest System (13)
- Wet Forest System (5)
- Wet Meadow/Carr System (1)

Date: 11/21/2017



Environmental data searched: MN DNR calcareous fens, wild rice locations, Natural Heritage (rare and endangered species), waterfowl production areas, trout streams and lakes, wildlife management areas, state parks, scientific and natural areas. Federal data: National forests,National Wetlands Inventory raster.

Figure 7
Potential Sensitive Receptors: Public Drinking Water Intakes Within 15-Mile Downstream TDL
Alexandria Municipal Well Contamination
Alexandria, Douglas County
MPCA Site SA247

MINNESOTA POLLUTION CONTROL AGENCY

INTERNAL USE ONLY - DO NOT DISTRIBUTE

North Well Field Approximate Location

15-Mile Downstream Target Distance Limit

PWSS -intake point type

- Groundwater under the influence of surface water (0)
- Groundwater (136)
- Purchased groundwater (0)
- Purchased surface water (0)
- Surface water (0)

Date: 11/21/2017

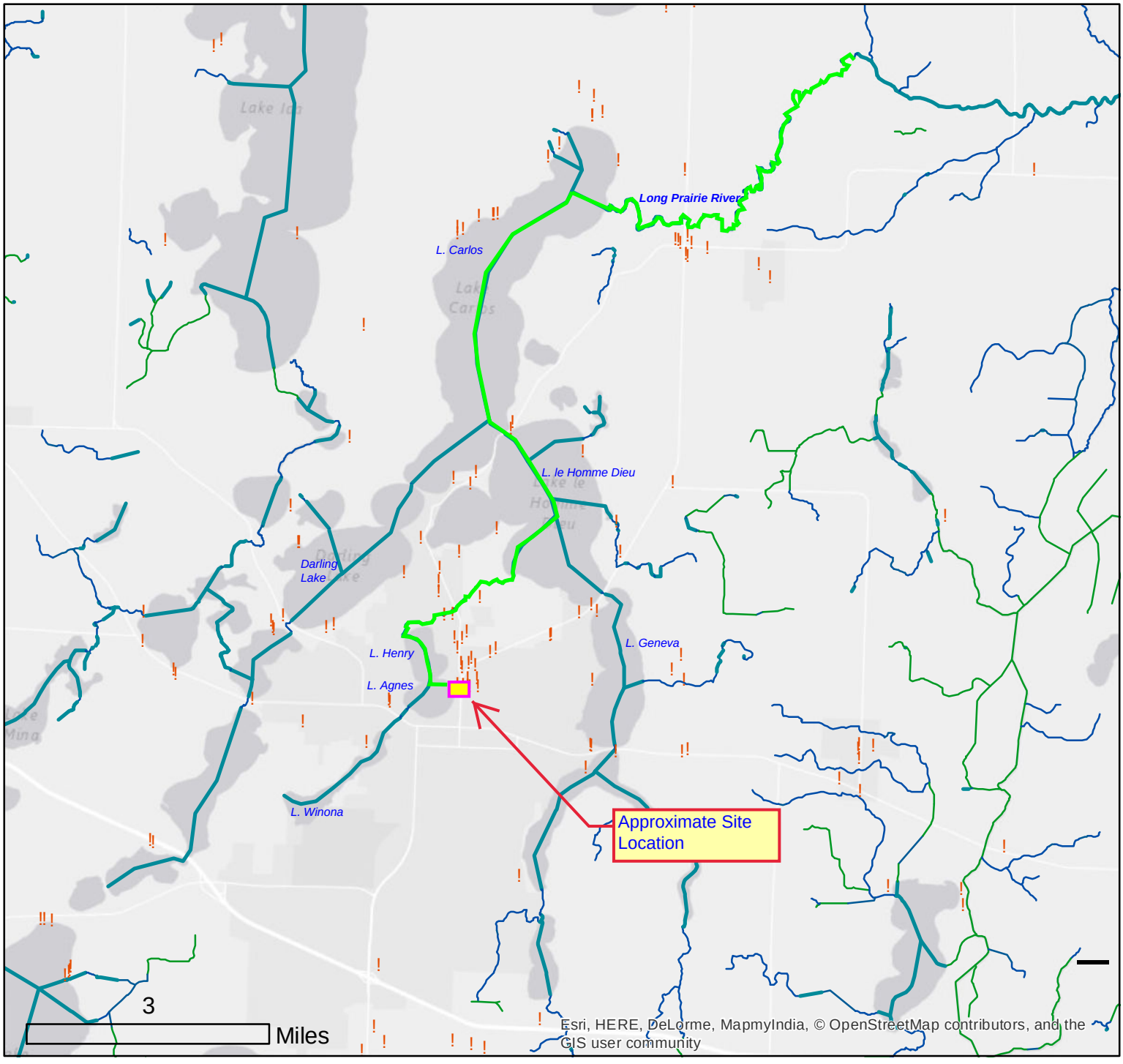
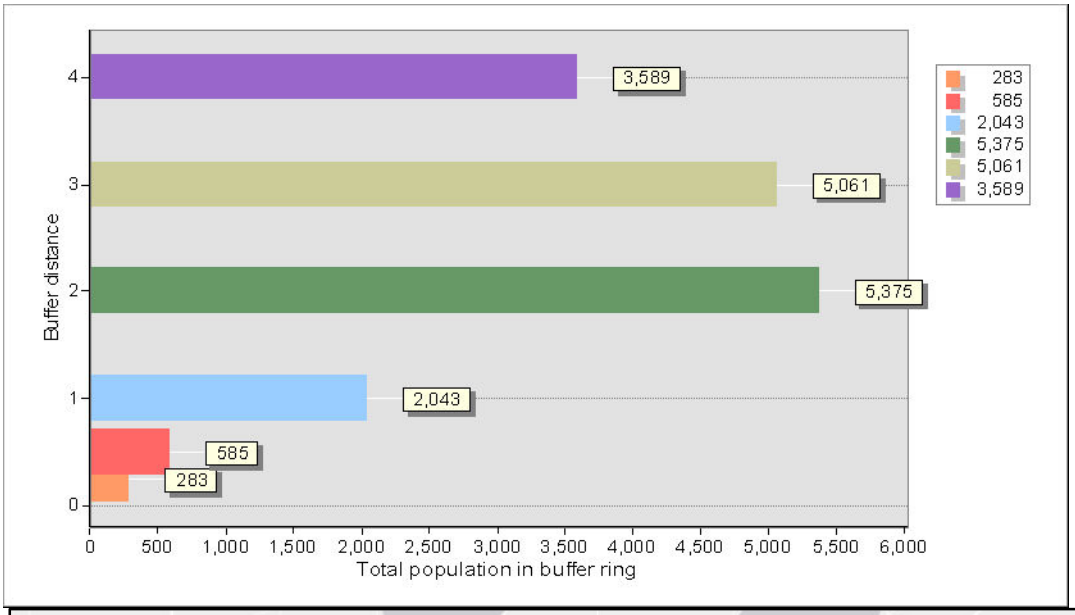


Figure 8
Potential Receptor Assessment: Population Within 4-Mile TDL
Alexandria Wells
Alexandria, MN
MPCA Site Assessment Program Site SA0000247



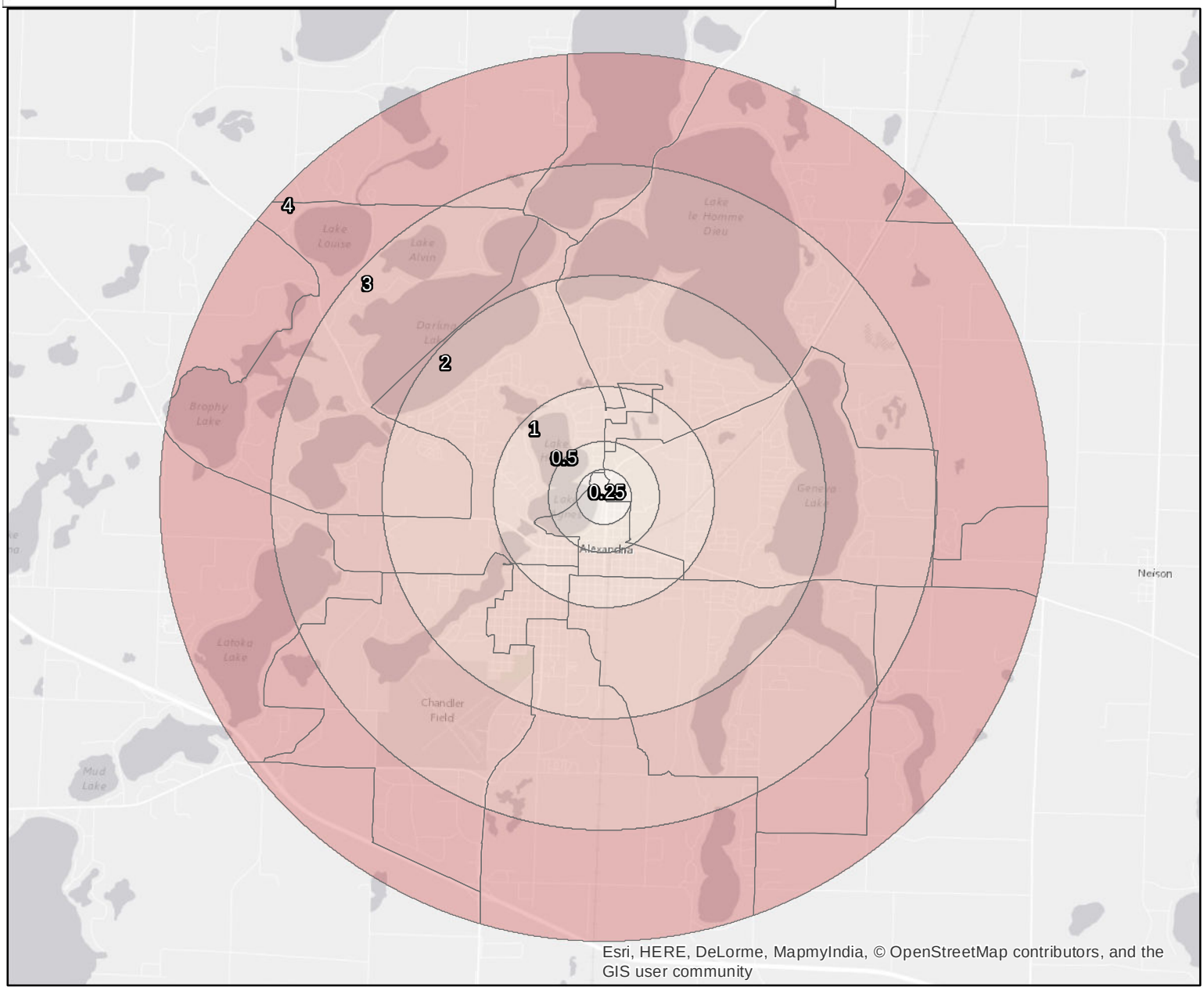


Figure 9
Potential Receptor Assessment: Wellhead Protection Areas that Intersect the 4-Mile TDL
Alexandria Wells
Alexandria, MN
MPCA Site Assessment Program Site SA0000247

MINNESOTA POLLUTION CONTROL AGENCY

Wellhead protection areas that intersect the buffer

Date: 11/17/2017

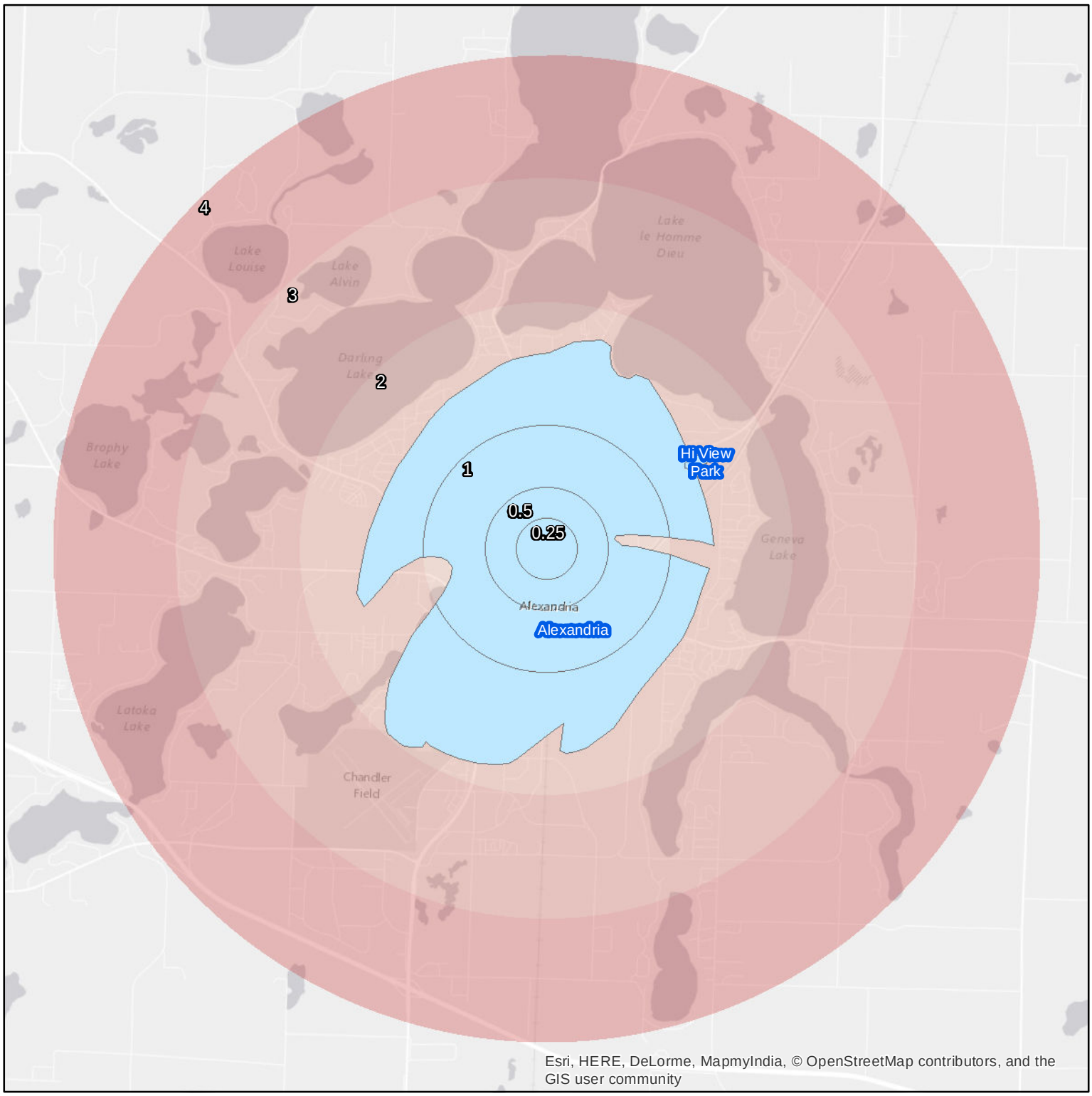
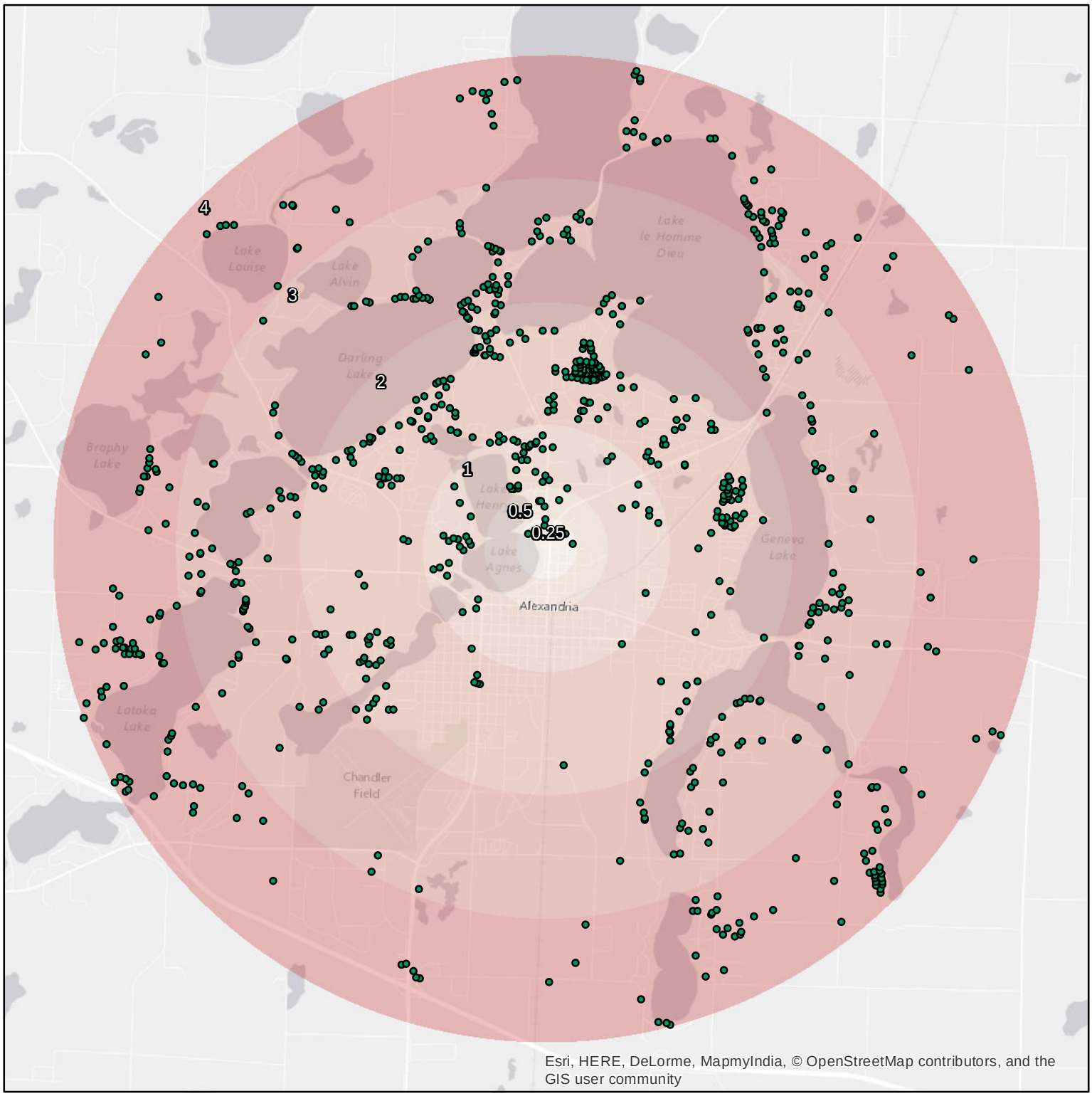


Figure 10
Potential Receptor Assessment: Registered Water Wells Located Within 4-Mile TDL
Alexandria Wells
Alexandria, MN
MPCA Site Assessment Program Site SA0000247

MINNESOTA POLLUTION CONTROL AGENCY

• Wells

Date: 11/17/2017



Tables

Table 1
Laboratory Analytical Results Summary - Chlorinated VOC only
City of Alexandria Municipal Supply Wells
MPCA Site ID: SA0000247

Well Name	Unique Well ID	Status	Sample Date	1,2-DCA	cis -1,2-Dichloroethene	1,4 Dichlorobenzene	Trichloroethene
Groundwater Criteria	**MN Criteria (*u* g/L - ppb)[G]**			**1**	**6**	**10**	**0.4**
	Criteria Type (see MDH Human Health-Based Water Guidance)			HRL13 Cancer	HBV14 Chronic	HRL94 Cancer	HRL15 Chronic
	MCL			**5**	**70**	**75**	**5**
Alexandria Municipal Well #4	214753	Active	1984	<0.1			<0.1
			06/07/84	**2.1**			<0.1
			07/13/84	<0.1			<0.1
			08/14/84	**1.6**			**0.6**
			11/28/84	**1.7**			**0.4**
			05/01/85	**2.5**			**0.7**
			05/14/85	**1.1**			**0.4**
			06/18/85	**1.1**			**0.5**
			10/17/86	**0.98**			<0.1
			9/23/93				<0.1
		Sealed - 6/2/98	6/18/96	**0.4**			**0.3**
Alexandria Municipal Well #6A	214754	Active	06/07/84	**0.2**			<0.1
			07/13/84	**1.0**			<0.1
			08/14/84	**0.2**			**0.5**
			11/28/84	**0.4**			**0.2**
			05/01/85	<0.1			**0.3**
		Sealed - 6/2/98	05/14/85	<0.1			**0.3**
Alexandria Municipal Well #7A (Mu7a)	214756	Active	05/15/84	**0.4**	<1.0	<1.0	<0.1
			08/14/84	**0.3**	<1.0	<1.0	<0.1
			11/28/84	**0.4**	<2.0	<2.0	<0.1
			05/01/85	**0.6**	<1.0	<1.0	<0.1
			10/17/86	**0.6**	<0.5	<0.5	<0.1
			06/18/96	**0.4**	<0.2	<0.2	<0.1
			09/05/01	**0.3**	<0.2	<0.2	<0.1
			06/03/02	<0.2	<0.2	<0.2	<0.1
			06/04/08	<1	<1	<1	<1
			09/29/08	<1	<1	<1	**1.2**
			12/01/08	<1	**1.1**	<1	**1.9**
			09/30/09	**0.5**	<1	<1	**1.1**
			12/21/09	**0.5**	**0.9**	<0.3	**1.6**
			03/31/10	<1	**1.3**	<0.5	**2.4**
			06/04/10	**0.5**	**1**	<0.3	**1.9**
			09/27/10	**0.8**	**2**	<0.5	**4.8**
		(Dup)	9/27/10d	**0.8**	**1.9**	<0.5	**5.1**
			12/16/10	**0.6**	**0.9**	<0.5	**1.8**
		(Dup)	12/16/10d	<0.5	**0.8**	<0.5	**1.6**
			03/29/11	<0.5	**0.8n**	<0.5	**2.2**
		(Dup)	3/29/11d	<0.5	**0.7n**	<0.5	**2.2**
			06/16/11	<0.5	**0.6**	<0.5	**1.3**
		(Dup)	6/16/11d	<0.5	<0.5	<0.5	**1.4**
			09/28/11	<1	<1	<1	**1.5**
		(Dup)	9/28/11d	<1	<1	<1	**1.5**
			12/15/11	**0.55**	**0.63**	<0.34	**1.8**
		(Dup)	12/15/11d	**0.41**	**0.83**	<0.34	**2.2**
			Well offline for repairs 2012-2014				
			07/31/14	<1	**1.1**	<1	**2.8**
			08/05/14	<1	**1.1**	<1	**2.8**
			11/06/14	<1	**1.4**	<1	<0.40
			01/19/15	<1	<1	<1	**1.5**
			04/28/15	**0.36 J**	**0.61 J**	<1	**1.5**
			08/05/15	<0.17	**0.51**	<0.16	**1.1**
		(Dup)	5/15/08d	**0.42 J**	**0.56**	<0.16	**1**
			11/23/15	**0.32 J**	**0.5J**	<0.16	**0.82**
		(Dup)	11/23/15d	<0.17	**0.32 J**	<0.16	**0.69 J**
			02/11/16	**0.21 J**	**0.41 J**	<0.16	**0.89**
		(Dup)	02/11/16d	<0.17	<0.25	<0.16	**0.9**
			05/23/16	**0.64 J**	**0.76 J**	<0.16	**1.4**
		(Dup)	5/23/16d	**0.64 J**	**0.71 J**	<0.16	**1.4**
			08/02/16	**0.5 J**	**0.40 J**	<0.21	**0.97**
		(Dup)	8/2/16d	**0.39 J**	**0.46 J**	<0.21	**0.97**
			11/16/16	**0.54J**	**0.65J**	<0.21	**1.2**
		(Dup)	11/16/16d	**0.61J**	**0.69J**	<0.21	**1.2**
			09/05/17	**0.44**	**0.79**	<0.20	**1.2**

Table 1
Laboratory Analytical Results Summary - Chlorinated VOC only
City of Alexandria Municipal Supply Wells
MPCA Site ID: SA0000247

Well Name	Unique Well ID	Status	Sample Date	1,2-DCA	cis -1,2-Dichloroethene	1,4 Dichlorobenzene	Trichloroethene
	MN Criteria (*u* g/L - ppb)[G]			1	6	10	0.4
Groundwater Criteria	Criteria Type (see MDH Human Health-Based Water Guidance)			HRL13 Cancer	HBV14 Chronic	HRL94 Cancer	HRL15 Chronic
	MCL			5	70	75	5
Alexandria Municipal Well #8A (Mu8a)	214758	Active	09/05/01	<0.2			<0.1
			06/04/08	<1	<1	<1	<1
			09/29/08	<1	<1	<1	<1
			12/01/08	<1	<1	<1	<1
			09/30/09	<0.5	<1	<1	<0.5
			12/21/09	<0.3	<0.3	<0.3	<0.4
			03/31/10	<1	<0.5	<0.5	<0.5
			06/04/10	<0.3	<0.3	0.3	<0.3
			09/27/10	<0.5	<0.5	<0.5	<1.0
			12/16/10	Well offline, no sample			
			03/29/11	Well offline, no sample			
			06/16/11	<0.5	<0.5	<0.5	<1
			09/28/11	<1	<1	<1	<1
			12/15/11	<0.23	<0.37	<0.34	<0.2
			03/28/12	<1	<1	<1	<1
			06/08/12	<1	<1	<1	<1
			09/20/12	<1	**0.21 J**	<1	**0.15 J**
			12/12/12	<1	<1	<1	<1
			03/14/13	<0.5	<0.5	<0.5	<0.5
			06/11/13	<0.5	<0.5	<0.5	<0.5
			03/27/14	<1	<1	<1	**0.77**
			06/11/14	<1	<1	<1	**0.94**
			08/05/14	<1	<1	<1	**0.67**
			11/06/14	<1	<1	<1	**0.60**
			01/19/15	<1	<1	<1	**0.52**
			04/28/15	<1	**0.32 J**	<1	**0.68**
			08/05/15	<0.17	<0.25	<0.16	<0.14
			11/23/15	**0.18 J**	<0.25	<0.16	**0.27 J**
			02/11/16	<0.17	<0.25	<0.16	<0.14
			05/23/16	**0.28 J**	<0.25	<0.16	**0.34 J**
			08/02/16	**0.32 J**	<0.12	<0.21	<0.2
			11/16/16	**0.37 J**	**0.13 J**	<0.21	**0.20 J**
			09/05/17	<0.20	**0.3**	<0.20	**0.41**
Alexandria Municipal Well #9 (Mu9)	214759	Active	09/05/01	<0.2			<0.1
			06/04/08	<1	<1	<1	<1
			09/29/08	<1	<1	<1	<1
			12/01/08	<1	<1	<1	<1
			09/30/09	<0.5	<1	<1	<0.5
			12/21/09	<0.3	<0.3	<0.3	<0.4
			03/31/10	Well offline, no sample			
			06/04/10	<0.3	<0.3	<0.3	<0.3
			09/27/10	<0.5	<0.5	<0.5	<1.0
			12/16/10	<0.5	<0.5	<0.5	<1.0
			03/29/11	<0.5	<0.5	<0.5	<1.0
			06/16/11	<0.5	<0.5	<0.5	<1
			09/28/11	<1	<1	<1	<1
			12/15/11	<0.23	<0.37	<0.34	<0.2
			03/28/12	<1	<1	<1	<1
			06/08/12	<1	<1	<1	<1
			09/20/12	<1	<1	<1	<1
			12/12/12	<1	<1	<1	<1
			03/14/13	<0.5	<0.5	<0.5	<0.5
			06/11/13	<0.5	<0.5	<0.5	<0.5
			03/27/14	<1	<1	<1	<1
			06/11/14	<1	<1	<1	<0.4
			08/05/14	<1	<1	<1	<0.5
			11/06/14	<1	<1	<1	<0.40
			01/19/15	<1	<1	<1	<0.40
			04/28/15	<1	<1	<1	<0.40
			08/05/15	<0.17	<0.25	<0.16	<0.14
			11/23/15	<0.17	<0.25	<0.16	<0.14
			02/11/16	<0.17	<0.25	<0.16	<0.14
			05/23/16	**0.24 J**	<0.25	<0.16	<0.14
			08/02/16	<0.17	<0.12	<0.21	<0.20
			11/16/16	<0.17	<0.12	<0.21	<0.20

Table 1
Laboratory Analytical Results Summary - Chlorinated VOC only
City of Alexandria Municipal Supply Wells
MPCA Site ID: SA0000247

Well Name	Unique Well ID	Status	Sample Date	1,2-DCA	cis -1,2-Dichloroethene	1,4 Dichlorobenzene	Trichloroethene
Groundwater Criteria	MN Criteria (ug/L - ppb)[G]			1	6	10	0.4
	Criteria Type (see MDH Human Health-Based Water Guidance)			HRL13 Cancer	HBV14 Chronic	HRL94 Cancer	HRL15 Chronic
	MCL			5	70	75	5
Alexandria Municipal Well #10 (Mu10)	241356	Sealed	09/05/01	<0.2			<0.1
			06/03/02	<0.2			<0.1
Alexandria Municipal Well #11 (Mu11)	241357	Sealed	06/03/02	0.3			<0.1
Alexandria Municipal Well #12 (Mu12)	475655	Sealed	09/10/02	<0.2			<0.1
Alexandria Municipal Well #13 (Mu13)	635452	Active	06/04/08	<1	<1	<1	<1
			09/29/08	Well offline, no sample			
			12/01/08	<1	<1	<1	<1
			09/30/09	Well offline, no sample			
			12/21/09	Well offline, no sample			
			03/31/10	<1	<0.5	<0.5	<0.5
			06/04/10	<0.3	<0.3	<0.3	<0.3
			09/27/10	<0.5	<0.5	<0.5	<1.0
			12/16/10	<1.0	<0.5	<0.5	<1.0
			03/29/11	<0.5	<0.5	<0.5	<1.0
			06/16/11	<0.5	<0.5	<0.5	<1
			09/28/11	<1	<1	<1	<1
			12/15/11	<0.23	<0.37	<0.34	<0.2
			03/28/12	<1	<1	<1	<1
			06/08/12	<1	<1	<1	<1
		Sealed	7/31/2012	Replaced by well MU-18			
Alexandria Municipal Well #14 (Mu14)	680655	Active	06/04/08	<1	<1	<1	<1
			09/29/08	<1	<1	<1	<1
			12/01/08	<1	<1	<1	<1
			09/30/09	<0.5	<1	<1	<0.5
			12/21/09	<0.3	<0.3	<0.3	<0.4
			03/31/10	<1	<0.5	<0.5	<0.5
			06/04/10	<0.3	<0.3	<0.3	<0.3
			09/27/10	Well offline, no sample			
			12/16/10	<1.0	<0.5	<0.5	<1.0
			03/29/11	<0.5	<0.5	<0.5	<1.0
			06/16/11	<0.5	<0.5	<0.5	<1
			09/28/11	<1	<1	<1	<1
			12/15/11	<0.23	<0.37	0.34	<0.2
			03/28/12	<1	<1	<1	<1
			06/08/12	<1	<1	<1	<1
			09/20/12	<1	<1	<1	<1
			12/12/12	<1	<1	<1	<1
			03/14/13	<0.5	<0.5	<0.5	<0.5
			06/11/13	<0.5	<0.5	<0.5	<0.5
			03/27/14	<1	<1	<1	<1
			06/11/14	<1	<1	<1	<0.4
			08/05/14	<1	<1	<1	<0.5
			11/06/14	<1	<1	<1	<0.40
			01/19/15	<1	<1	<1	<0.40
			04/28/15	<1	<1	<1	<0.40
			08/05/15	<0.17	<0.25	<0.16	<0.14
			11/23/15	<0.17	<0.25	<0.16	<0.14
			02/11/16	<0.17	<0.25	<0.16	<0.14
			05/23/16	**0.18 J**	<0.25	<0.16	<0.14
			08/02/16	<0.17	<0.12	<0.21	<0.20
			11/16/16	<0.17	<0.12	<0.21	<0.20

Table 1
Laboratory Analytical Results Summary - Chlorinated VOC only
City of Alexandria Municipal Supply Wells
MPCA Site ID: SA0000247

Well Name	Unique Well ID	Status	Sample Date	1,2-DCA	cis -1,2-Dichloroethene	1,4 Dichlorobenzene	Trichloroethene
	MN Criteria (*u* g/L - ppb)[G]			1	6	10	0.4
Groundwater Criteria	Criteria Type (see MDH Human Health-Based Water Guidance)			HRL13 Cancer	HBV14 Chronic	HRL94 Cancer	HRL15 Chronic
	MCL			5	70	75	5
Alexandria Municipal Well #15 (Mu15)	685764	Active	06/04/08	<1	<1	<1	<1
			09/29/08	<1	<1	<1	<1
			12/01/08	<1	<1	<1	<1
			09/30/09	<0.5	<1	<1	<0.5
			12/21/09	<0.3	<0.3	<0.3	<0.4
			03/31/10	<1	<0.5	<0.5	<0.5
			06/04/10	<0.3	<0.3	<0.3	<0.3
			09/27/10	<0.5	<0.5	<0.5	<1.0
			12/16/10	<0.5	<0.5	<0.5	<1.0
			03/29/11	<0.5	<0.5	<0.5	<1.0
			06/16/11	<0.5	<0.5	<0.5	<1
			09/28/11	<1	<1	<1	<1
			12/15/11	<0.23	<0.37	<0.34	<0.2
			03/28/12	<1	<1	<1	<1
			06/08/12	<1	<1	<1	<1
			09/20/12	<1	<1	<1	<1
			12/12/12	<1	<1	<1	<1
			03/14/13	<0.5	<0.5	<0.5	<0.5
			06/11/13	<0.5	<0.5	<0.5	<0.5
			03/27/14	<1	<1	<1	<1
			06/11/14	<1	<1	<1	<0.4
			08/05/14	<1	<1	<1	<0.5
			11/06/14	<1	<1	<1	<0.40
			01/19/15	<1	<1	<1	<0.40
			04/28/15	<1	<1	<1	<0.40
			08/05/15	<0.17	<0.25	<0.16	<0.14
			11/23/15	<0.17	<0.25	<0.16	<0.14
			02/11/16	<0.17	<0.25	<0.16	<0.14
			05/23/16	<0.17	<0.25	<0.16	<0.14
		Sealed	7/20/2016	Well sealed, replaced by well MU-20			
Alexandria Municipal Well #16 (Mu16), (New well in place of MU #11)	749302	Active	06/04/08	<1	<1	<1	<1
			09/29/08	<1	<1	<1	<1
			12/01/08	<1	<1	<1	<1
			09/30/09	<0.5	<1	<1	<0.5
			12/21/09	<0.3	<0.3	<0.3	<0.4
			03/31/10	<1	<0.5	<0.5	<0.5
			06/04/10	<0.3	<0.3	<0.3	<0.3
			09/27/10	<0.5	<0.5	<0.5	<1.0
			12/16/10	<0.5	<0.5	<0.5	<1.0
			03/29/11	<0.5	<0.5	<0.5	<1.0
			06/16/11	<0.5	<0.5	<0.5	<1
			09/28/11	<1	<1	<1	<1
			12/15/11	<0.23	<0.37	<0.34	<0.2
			03/28/12	<1	<1	<1	<1
			06/08/12	<1	<1	<1	<1
			09/20/12	<1	<1	<1	<1
			12/12/12	<1	<1	<1	<1
			06/11/13	<0.5	<0.5	<0.5	<0.5
			03/27/14	<1	<1	<1	<1
			06/11/14	<1	<1	<1	<0.4
			08/05/14	<1	<1	<1	<0.5
			11/06/14	<1	<1	<1	<0.40
			01/19/15	<1	<1	<1	<0.40
			04/28/15	<1	<1	<1	<0.40
			08/05/15	<0.17	<0.25	<0.16	<0.14
			11/23/15	<0.17	<0.25	<0.16	<0.14
			02/11/16	<0.17	<0.25	<0.16	<0.14
			05/23/16	<0.17	<0.25	<0.16	<0.14
			08/02/16	<0.17	<0.12	<0.21	<0.20
			11/16/16	<0.17	<0.12	<0.21	<0.20

Table 1
Laboratory Analytical Results Summary - Chlorinated VOC only
City of Alexandria Municipal Supply Wells
MPCA Site ID: SA0000247

Well Name	Unique Well ID	Status	Sample Date	1,2-DCA	cis -1,2-Dichloroethene	1,4 Dichlorobenzene	Trichloroethene
Groundwater Criteria	**MN Criteria (*u* g/L - ppb)[G]**			**1**	**6**	**10**	**0.4**
	Criteria Type (see MDH Human Health-Based Water Guidance)			HRL13 Cancer	HBV14 Chronic	HRL94 Cancer	HRL15 Chronic
	MCL			**5**	**70**	**75**	**5**
Alexandria Municipal Well #17, (New well in place of MU #12)	762288	Active	12/01/08	<1	<1	<1	<1
			09/30/09	<0.5	<1	<1	<0.5
			12/21/09	<0.3	<0.3	<0.3	<0.4
			03/31/10	<1	<0.5	<0.5	<0.5
			06/04/10	<0.3	<0.3	<0.3	<0.3
			09/27/10	<0.5	<0.5	<0.5	<1.0
			12/16/10	<0.5	<0.5	<0.5	<1.0
			03/29/11	<0.5	<0.5	<0.5	<1.0
			06/16/11	<0.5	<0.5	<0.5	<1
			09/28/11	<1	<1	<1	<1
			12/15/11	<0.23	<0.37	<0.34	<0.2
			03/28/12	<1	<1	<1	<1
			06/08/12	<1	<1	<1	<1
			09/20/12	<1	<1	<1	<1
			12/12/12	<1	<1	<1	<1
			03/14/13	<0.5	<0.5	<0.5	<0.5
			06/11/13	<0.5	<0.5	<0.5	<0.5
			03/27/14	<1	<1	<1	<1
			06/11/14	<1	<1	<1	<0.4
			08/05/14	<1	<1	<1	<0.4
			11/06/14	<1	<1	<1	<0.40
			01/19/15	<1	<1	<1	<0.40
			04/28/15	<1	<1	<1	<0.40
			08/05/15	<0.17	<0.25	<0.16	<0.14
			11/23/15	<0.17	<0.25	<0.16	<0.14
			02/11/16	<0.17	<0.25	<0.16	<0.14
			05/23/16	<0.17	<0.25	<0.16	<0.14
			08/02/16	<0.17	<0.12	<0.21	<0.20
			11/30/16	<0.17	<0.12	<0.21	<0.20
Ballpark Well, (City Test Well at Discovery School)	601366	Standby	06/04/08	<1	<1	<1	<1
			09/29/08	<1	<1	<1	<1
			12/01/08	Well winterized, no sample			
			09/30/09	<0.5	<1	<1	<0.5
			12/21/09	Well winterized, no sample			
			03/31/10	Well winterized, no sample			
			06/07/10	<0.3	<0.3	<0.3	<0.3
			09/27/10	<0.5	<0.5	<0.5	<1
			12/16/10	Well winterized, no sample			
			03/29/11	Well winterized, no sample			
			06/16/11	<0.5	<0.5	<0.5	<1
			09/28/11	<1	<1	<1	<1
			12/15/11	Well winterized, no sample			
			06/08/12	<1	<1	<1	<1
			09/20/12	<1	<1	<1	<1
			12/12/12	Well winterized, no sample			
			06/11/14	<1	<1	<1	<0.4
			08/05/14	<1	<1	<1	<0.4
			11/06/14	<1	<1	<1	<0.40
			01/19/15	Well winterized, no sample			
			04/28/15				

Table 1
Laboratory Analytical Results Summary - Chlorinated VOC only
City of Alexandria Municipal Supply Wells
MPCA Site ID: SA0000247

Well Name	Unique Well ID	Status	Sample Date	1,2-DCA	cis -1,2-Dichloroethene	1,4 Dichlorobenzene	Trichloroethene
Groundwater Criteria	**MN Criteria (*u* g/L - ppb)[G]**			**1**	**6**	**10**	**0.4**
	Criteria Type (see MDH Human Health-Based Water Guidance)			HRL13 Cancer	HBV14 Chronic	HRL94 Cancer	HRL15 Chronic
	MCL			**5**	**70**	**75**	**5**
Municipal Well 18	791566	Active	03/14/13	<0.5	<0.5	<0.5	<0.5
			06/11/13	<0.5	<0.5	<0.5	<0.5
			03/27/14	<1	<1	<1	<1
			06/11/14	<1	<1	<1	<0.4
			08/05/14	<1	<1	<1	<0.4
			11/06/14	<1	<1	<1	<0.40
			01/19/15	<1	<1	<1	<0.40
			04/28/15	<1	<1	<1	<0.40
			08/05/15	<0.17	<0.25	<0.16	<0.14
			11/23/15	<0.17	<0.25	<0.16	<0.14
			02/11/16	<0.17	<0.25	<0.16	<0.14
			05/23/16	<0.17	<0.25	<0.16	<0.14
			08/02/16	<0.17	<0.12	<0.21	<0.20
			11/16/16	<0.17	<0.12	<0.21	<0.20
Municipal Well 19	810340	Active	02/11/16	<0.17	<0.25	<0.16	<0.14
			05/23/16	**0.23** J	<0.25	<0.16	<0.14
			08/02/16	<0.17	<0.12	<0.21	<0.20
			11/16/16	<0.17	<0.12	<0.21	<0.20
Municipal Well 20	821203	Active	11/16/16	<0.17	<0.12	<0.21	<0.20
Finished Water *	NA		06/16/11	<0.5	<0.5	<0.5	<1
			09/30/11	<1	<1	<1	<1
			12/15/11	<0.23	<0.37	<0.34	<0.2
			03/28/12	<1	<1	<1	<1
			06/08/12	<1	<1	<1	<1
			09/20/12	<1	<1	<1	<1
Treatment Plant #3 (Finished drinking water sample)	NA		9/5/2017	<0.2	<0.20	<0.20	<0.10

Notes:
Results are reported in µg/L
Yellow indicates value exceeds MN Criteria
Municipal Supply Wells MU-1, MU-2, MU-3, MU-5, MU-6, MU-7, MU-8 have all been sealed. There is no known laboratory analytical results for these wells.

Blank spaces indicate laboratory analysis did not include designated contaminant
G = Minnesota Criteria: Values listed are from the Minnesota Department of Health's (MDH's) Groundwater Values Table (http://www.health.state.mn.us/divs/eh/risk/guidance/gw/table.html);

J = Analytical reseult was estimated
B = Analyte was detected in the associated method blank
* Municipal Finished Water was collected from the sampling port in the pipe to the clear well (storage tank), just before the addition of the treatment chemicals.

Sampling conducted in accordance with Minnesota Department of Health public water supply requirements.
Blank spaces indicate Not Analyzed in the laboratory (See lab reports).

Table 2
Laboratory Analytical Results Summary - Chlorinated VOC only
Other Water Supply Wells and Monitoring Wells
MPCA Site ID: SA0000247

Well Name	Unique Well ID	Status	Sample Date	1,2-DCA	*cis*-1,2-Dichloroethene	1,4 Dichlorobenzene	Trichloroethene
Groundwater Criteria	MN Criteria (*u* g/L - ppb)[G]			1	6	10	0.4
	Criteria Type (see MDH Human Health-Based Water Guidance)			HRL13 Cancer	HBV14 Chronic	HRL94 Cancer	HRL15 Chronic
	MCL			5	70	75	5
Erickson Towing (aka - Alexandria/Viking Towing)			4/16/1997	**0.5**	**1.7**	NR	**4.4**
			9/30/2009	**0.6**	<1	<1	**1.2**
			12/21/2009	**0.4**	<0.3	<0.3	**0.4**
			3/31/2010	<1	<0.5	<0.5	**1.3**
			6/4/2010	**0.5**	<0.3	<0.3	**1.1**
			9/27/2010	<0.5	<0.5	<0.5	**1.2**
			12/16/2010	<0.5	<0.5	<0.5	**1.2**
			3/29/2011	<0.5	<0.5	<0.5	<1.0
			6/16/2011	<0.5	<0.5	<0.5	<1
			9/28/2011	<1	<1	<1	**1.2**
			12/15/2011	**0.26**	<0.37	<0.34	**1.5**
			3/28/2012	<1	<1	<1	**2.8**
			6/8/2012	<1	<1	<1	**2.9**
			9/20/2012	<1	<1	<1	**2.5**
			12/12/2012	<1	<1	<1	**2.7**
			3/14/2013	<0.5	<0.5	<0.5	**2.1**
			6/11/2013	<0.5	<0.5	<0.5	**2.9**
			3/27/2014	<1	<1	<1	**1.7**
			6/11/2014	<1	<1	<1	**1.9**
			8/5/2014	<1	<1	<1	**1.7**
Christopherson Bait & Tackle	635821	Active	4/16/1997	**0.7**	NR	NR	**0.8**
			9/30/2009	<0.5	<1	<1	**0.9**
			12/21/2009	<0.3	<0.3	<0.3	**1.1**
			3/31/2010	<1	<0.5	<0.5	**1.3**
			6/4/2010	<0.3	<0.3	<0.3	**1**
			9/27/2010	<0.5	<0.5	<0.5	**1.3**
			12/16/2010	<1.0	<0.5	<0.5	**1.1**
			3/29/2011	<0.5	<0.5	<0.5	<1.0
			6/16/2011	<1	<0.5	<0.5	<1
			9/28/2011	<1	<1	<1	<1
			12/15/2011	<0.23	<0.37	<0.34	**0.82**
			3/28/2012	<1	<1	<1	<1
			6/8/2012	<1	<1	<1	<1
			9/20/2012	<1	<1	<1	**.78J**
			12/12/2012	<1	<1	<1	<1
			3/14/2013	<0.5	<0.5	<0.5	**0.71**
			6/11/2013	<0.5	<0.5	<0.5	**0.81**
			3/27/2014	<1.0	<1.0	<1	**0.82**
			6/11/2014	<1.0	<1.0	<1	**1**
			8/5/2014	<1.0	<1.0	<1	**0.91**
MW-2D	809700	Active	1/9/2015	<1.0	<1.0	<1.0	**0.68**
			4/29/2015	<1.0	<1.0	<1.0	<0.40

Notes:
Results are reported in µg/L
Yellow indicates value exceeds MN Criteria
Municipal Supply Wells MU-1, MU-2, MU-3, MU-5, MU-6, MU-7, MU-8 have all been sealed. There is no known laboratory analytical results for these wells.

Blank spaces indicate laboratory analysis did not include designated contaminant
G = Minnesota Criteria: Values listed are from the Minnesota Department of Health's (MDH's) Groundwater Values Table (http://www.health.state.mn.us/divs/eh/risk/guidance/gw/table.html);

J = Analytical reseult was estimated
B = Analyte was detected in the associated method blank
Sampling conducted in accordance with Minnesota Department of Health public water supply requirements.
NR = Not Reported

Appendices

Appendix A

Minnesota Unique Well Number

214753

County Douglas
Quad Alexandria
Quad ID 180B

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING REPORT

Minnesota Statutes Chapter 1031

Entry Date 04/07/1988
Update Date 03/10/2014
Received Date

Well Name	Township	Range	Dir	Section	Subsection
ALEXANDRIA 4	128	37	W	18	CDDDAC

Elevation 1390 **Elev. Method** 7.5 minute topographic map (+/- 5 feet)

Address

Well ALEXANDRIA MN 56308

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
BRICK WALL &	0	6		
FILL & OLD PIPE	6	10		
SAND, STICKY, RED	10	18		
SAND, STONEY, GRAY	18	31		
CLAY	31	73	BLUE	
SAND & GRAVEL	73	80		
SAND & SOME FINE	80	85		
SAND SOME COARSE	85	99		
SAND, FINE	99	105		

Remarks

WELL SEALED 06-02-1998 BY 21532

Well Depth 105 ft. **Depth Completed** 105 ft. **Date Well Completed** 00/00/1938

Drill Method Cable Tool **Drill Fluid**

Use public supply/non-community **Status** Sealed

Well Hydrofractured? Yes ☐ No ☐ **From** **To**

Casing Type Single casing **Joint**

Drive Shoe? Yes ☐ No ☐ **Above/Below**

Casing Diameter **Weight**

16 in. To 75 ft. lbs./ft.

Open Hole From ft. To ft.

Screen? ☒ **Type** **Make**

Diameter Slot/Gauze Length Set

in. 30 ft. 0 ft. 105 ft.

Static Water Level

30 ft. land surface Measure 00/00/1938

Pumping Level (below land surface)

0 ft. hrs. Pumping at 500 g.p.m.

Wellhead Completion

Pitless adapter manufacturer Model

☐ Casing Protection ☐ 12 in. above grade

☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☐ Yes ☐ No ☐ Not Specified

Nearest Known Source of Contamination

feet Direction Type

Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed

Manufacturer's name

Model Number HP Volt

Length of drop pipe ft Capacity g.p. Typ

Abandoned

Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

Variance

Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Miscellaneous

First Bedrock Aquifer Quat. buried

Last Strat sand Depth to Bedrock ft

Located by Minnesota Geological Survey

Locate Method Digitized - scale 1:24,000 or larger (Digitizing Table)

System UTM - NAD83, Zone 15, Meters X 315489 Y 5084567

Unique Number Verification Information from Input Date 01/01/1990

Angled Drill Hole

Well Contractor

Keys Well Co. 62012

Licensee Business Lic. or Reg. No. Name of Driller

Minnesota Unique Well Number

214754

County Douglas
Quad Alexandria
Quad ID 180B

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING REPORT

Minnesota Statutes Chapter 1031

Entry Date 04/07/1988
Update Date 03/10/2014
Received Date

Well Name	Township	Range	Dir	Section	Subsection
ALEXANDRIA 6A	128	37	W	19	BAABBA

Elevation 1395 **Elev. Method** 7.5 minute topographic map (+/- 5 feet)

Address

Well ALEXANDRIA MN 56308

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
CLAY	0	73		
SAND	73	105		
DIRTY SAND	105	110		

Remarks

WELL SEALED 06-02-1998 BY 21532

Well Depth 110 ft. **Depth Completed** 105 ft. **Date Well Completed** 12/00/1961

Drill Method Cable Tool **Drill Fluid**

Use public supply/non-community **Status** Sealed

Well Hydrofractured? Yes ☐ No ☐ **From** **To**

Casing Type Single casing **Joint**

Drive Shoe? Yes ☐ No ☐ **Above/Below** 2 ft.

Casing Diameter	Weight
16 in. To 80 ft.	lbs./ft.

Open Hole From ft. To ft.

Screen? ☒

Type	Make	Diameter	Slot/Gauze	Length	Set
		16 in.		24 ft.	80 ft. 105 ft.

Static Water Level

27.5 ft. land surface Measure 12/00/1961

Pumping Level (below land surface)

64.8 ft. hrs. Pumping at 1000 g.p.m.

Wellhead Completion

Pitless adapter manufacturer Model

☐ Casing Protection ☒ 12 in. above grade

☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☐ Yes ☐ No ☐ Not Specified

Nearest Known Source of Contamination

feet Direction Type

Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed

Manufacturer's name

Model Number HP Volt

Length of drop pipe ft Capacity g.p. Typ

Abandoned

Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

Variance

Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Miscellaneous

First Bedrock Aquifer Quat. buried

Last Strat sand+silt Depth to Bedrock ft

Located by Minnesota Geological Survey

Locate Method Digitized - scale 1:24,000 or larger (Digitizing Table)

System UTM - NAD83, Zone 15, Meters X 315461 Y 5084453

Unique Number Verification Information from Input Date 01/01/1990

Angled Drill Hole

Well Contractor

Licensee Business	Lic. or Reg. No.	Name of Driller
Keys Well Co.	62012	KEYS WELL

Minnesota Unique Well Number

214756

County Douglas
Quad Alexandria
Quad ID 180A

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING REPORT

Minnesota Statutes Chapter 1031

Entry Date 04/07/1988
Update Date 05/19/2016
Received Date

Well Name	Township	Range	Dir	Section	Subsection
ALEXANDRIA 7A	128	37	W	18	DAAADD

Elevation 1403 **Elev. Method** Calc from DEM (USGS 7.5 min or equiv.)

Address

Well ALEXANDRIA MN 56308

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
NO RECORD	0	129		

Remarks

DRILLER: MINNESOTA WELL DRILLERS MADISON, MINNESOTA

Well Depth	Depth Completed	Date Well Completed
129 ft.	129 ft.	09/00/1959

Drill Method **Drill Fluid**

Use community supply(municipal) **Status** Active

Well Hydrofractured? **Yes** ☐ **No** ☐ **From** **To**

Casing Type Single casing **Joint**
Drive Shoe? **Yes** ☐ **No** ☐ **Above/Below**

Casing Diameter **Weight**
16 in. To ft. lbs./ft.

Open Hole From ft. To ft.

Screen? ☐ **Type** **Make**

Static Water Level
38 ft. land surface Measure 09/00/1959

Pumping Level (below land surface)
58 ft. hrs. Pumping at 440 g.p.m.

Wellhead Completion
Pitless adapter manufacturer Model
☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☐ Yes ☐ No ☐ Not Specified

Nearest Known Source of Contamination
feet Direction Type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed
Manufacturer's name
Model Number HP Volt
Length of drop pipe ft Capacity g.p. Typ

Abandoned
Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

Variance
Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Miscellaneous
First Bedrock Aquifer Quat. buried
Last Strat Quaternary deposit Depth to Bedrock ft
Located by Minnesota Department of Health
Locate Method Digitization (Screen) - Map (1:24,000)
System UTM - NAD83, Zone 15, Meters X 316347 Y 5085202
Unique Number Verification Info/GPS from data Input Date 04/27/2000

Angled Drill Hole

Well Contractor
Minnesota Dept. of Natural MNDNR
Licensee Business Lic. or Reg. No. Name of Driller

Minnesota Unique Well Number

214758

County Douglas
Quad Alexandria
Quad ID 180A

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING REPORT

Minnesota Statutes Chapter 1031

Entry Date 04/07/1988
Update Date 03/10/2014
Received Date

Well Name	Township	Range	Dir	Section	Subsection
ALEXANDRIA 8A	128	37	W	17	BCCCDD

Elevation 1400 **Elev. Method** Calc from DEM (USGS 7.5 min or equiv.)

Address

Well ALEXANDRIA MN 56308

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
BLACK DIRT	0	1		
CLAY & SAND	1	14		
SAND	14	34		
CLAY	34	54		
SAND & CLAY	54	61		
HARDPAN	61	89		
SAND	89	119		
FINE SAND (BACK-	119	125		
CLAY	125	125		

Remarks

Well Depth 125 ft. **Depth Completed** 119 ft. **Date Well Completed** 01/00/1962

Drill Method Cable Tool **Drill Fluid**

Use community supply(municipal) **Status** Active

Well Hydrofractured? Yes ☐ No ☐ **From** **To**

Casing Type Single casing **Joint**
Drive Shoe? Yes ☐ No ☐ **Above/Below** 2 ft.

Casing Diameter **Weight**
16 in. To 101 ft. lbs./ft.

Open Hole From ft. To ft.

Screen? ☒ **Type** **Make** EVERDUR

Diameter	Slot/Gauze	Length	Set	
16 in.		20 ft.	99 ft.	119 ft.

Static Water Level
39 ft. land surface Measure 01/00/1962

Pumping Level (below land surface)
54 ft. hrs. Pumping at 500 g.p.m.

Wellhead Completion
Pitless adapter manufacturer Model
☐ Casing Protection ☒ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☐ Yes ☐ No ☐ Not Specified

Nearest Known Source of Contamination
feet Direction Type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed
Manufacturer's name
Model Number HP Volt
Length of drop pipe 85 ft Capacity g.p. Typ

Abandoned
Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

Variance
Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Miscellaneous
First Bedrock Aquifer Quat. buried
Last Strat clay Depth to Bedrock ft
Located by Minnesota Department of Health
Locate Method GPS SA On (averaged)
System UTM - NAD83, Zone 15, Meters X 316445 Y 5085317
Unique Number Verification Information from Input Date 02/18/2000

Angled Drill Hole

Well Contractor

Keys Well Co.	62012	KEMPER, R.
Licensee Business	Lic. or Reg. No.	Name of Driller

Minnesota Unique Well Number

214759

County Douglas
Quad Alexandria
Quad ID 180A

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING REPORT

Minnesota Statutes Chapter 1031

Entry Date 04/07/1988
Update Date 03/10/2014
Received Date

Well Name	Township	Range	Dir	Section	Subsection
ALEXANDRIA 9	128	37	W	18	ADDDBD

Elevation 1396 **Elev. Method** Calc from DEM (USGS 7.5 min or equiv.)

Address

Well ALEXANDRIA MN 56308

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
NO RECORD	0	118		

Remarks

USE OF WELL IS PUBLIC SUPPLY

Well Depth	Depth Completed	Date Well Completed
118 ft.	118 ft.	02/00/1958

Drill Method **Drill Fluid**

Use community supply(municipal) **Status** Active

Well Hydrofractured? **Yes** ☐ **No** ☐ **From** **To**

Casing Type Single casing **Joint**
Drive Shoe? **Yes** ☐ **No** ☐ **Above/Below**

Casing Diameter **Weight**
16 in. To 96 ft. lbs./ft.

Open Hole From ft. To ft.

Screen? ☒ **Type** **Make**

Diameter	Slot/Gauze	Length	Set	
in.		25 ft.	96 ft.	118 ft.

Static Water Level
38 ft. land surface Measure 02/00/1958

Pumping Level (below land surface)
58 ft. hrs. Pumping at 440 g.p.m.

Wellhead Completion
Pitless adapter manufacturer Model
☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☐ Yes ☐ No ☐ Not Specified

Nearest Known Source of Contamination
feet Direction Type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed
Manufacturer's name
Model Number HP Volt
Length of drop pipe ft Capacity 500 g.p. Typ

Abandoned
Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

Variance
Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Miscellaneous
First Bedrock Aquifer Quat. buried
Last Strat Quaternary deposit Depth to Bedrock ft
Located by Minnesota Department of Health
Locate Method GPS SA On (averaged)
System UTM - NAD83, Zone 15, Meters X 316341 Y 5085341
Unique Number Verification Input Date 04/27/2000

Angled Drill Hole

Well Contractor

Licensee Business	Lic. or Reg. No.	Name of Driller
Thein Well Co. Clara City	12013	62012

Minnesota Unique Well Number

680655

County Douglas
Quad Alexandria
Quad ID 180A

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING REPORT

Minnesota Statutes Chapter 1031

Entry Date 12/26/2002
Update Date 09/30/2016
Received Date

Well Name	Township	Range	Dir	Section	Subsection
ALEXANDRIA 14	128	37	W	17	BCDDDA

Elevation 1403 **Elev. Method** LiDAR 1m DEM (MNDNR)

Address

Well 314 OAK ST N ALEXANDRIA MN
Contact P.O. BOX 609 ALEXANDRIA MN 56308

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
TOP SOIL	0	1		
CLAY	1	17	YELLOW	
CLAY	17	54	BLUE	
ROCK	54	55		
CLAY	55	73	BLUE	
CLAY	73	87	LT. BLU	
SAND & GRAVEL	87	127		
CLAY	127	140	BLUE	

Remarks

Well Depth 140 ft. **Depth Completed** 127 ft. **Date Well Completed** 12/02/2002

Drill Method Non-specified Rotary **Drill Fluid** Bentonite

Use community supply(municipal) **Status** Active

Well Hydrofractured? Yes ☐ No ☒ **From** **To**

Casing Type Single casing **Joint** Welded
Drive Shoe? Yes ☐ No ☒ **Above/Below**

Casing Diameter	Weight	Hole Diameter
12 in. To 92 ft.	lbs./ft.	20 in. To ft.

Open Hole From ft. To ft.

Screen? ☒ **Type** stainless **Make** JOHNSON

Diameter	Slot/Gauze	Length	Set
12 in.	100	35 ft.	92 ft. 127 ft.

Static Water Level
53.8 ft. land surface Measure 08/22/2002

Pumping Level (below land surface)
70.7 ft. 24 hrs. Pumping at 720 g.p.m.

Wellhead Completion
Pitless adapter manufacturer Model
☐ Casing Protection ☒ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☒ Yes ☐ No ☐ Not Specified

Material	Amount	From	To
neat cement	4.5 Cubic yards	0 ft.	80 ft.

Nearest Known Source of Contamination
50 feet Direction Septic tank/drain field Type
Well disinfected upon completion? ☒ Yes ☐ No

Pump ☐ Not Installed Date Installed 11/18/2002
Manufacturer's name GOULDS
Model Number 9RCHC HP 28 Volt 230
Length of drop pipe 70 ft Capacity 500 g.p. Typ Turbine

Abandoned
Does property have any not in use and not sealed well(s)? ☐ Yes ☒ No

Variance
Was a variance granted from the MDH for this well? ☐ Yes ☒ No

Miscellaneous
First Bedrock Aquifer Quat. buried
Last Strat sand +larger Depth to Bedrock ft
Located by Minnesota Department of Health
Locate Method GPS SA Off (averaged)
System UTM - NAD83, Zone 15, Meters X 316737 Y 5085295
Unique Number Verification Info/GPS from data Input Date 08/15/2002

Angled Drill Hole

Well Contractor
Thein Well Co. 34625 THEIN, R.
Licensee Business Lic. or Reg. No. Name of Driller

Minnesota Unique Well Number

749302

County Douglas
Quad Alexandria
Quad ID 180A

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING REPORT

Minnesota Statutes Chapter 1031

Entry Date 09/10/2007
Update Date 09/30/2016
Received Date 08/20/2007

Well Name	Township	Range	Dir	Section	Subsection
ALEXANDRIA 16	128	37	W	17	BCCAAC

Elevation 1398 **Elev. Method** LiDAR 1m DEM (MNDNR)

Address

Well 29 SH ALEXANDRIA MN 56308
Contact P.O. BOX 609 ALEXANDRIA MN 56308

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
TOPSOIL	0	1	BLACK	SOFT
CLAY & FILL	1	5	GRAY	MEDIUM
SAND	5	21	BROWN	MEDIUM
CLAY	21	84	GRAY	MEDIUM
SAND	84	120	GRAY	MEDIUM

Remarks

DRILLERS: DEAN, STEVE, RICK & ROB.

Well Depth 120 ft. **Depth Completed** 120 ft. **Date Well Completed** 05/14/2007

Drill Method Non-specified Rotary **Drill Fluid** Qwik gel

Use community supply(municipal) **Status** Active

Well Hydrofractured? Yes ☐ No ☒ **From** **To**

Casing Type Single casing **Joint**
Drive Shoe? Yes ☐ No ☒ **Above/Below**

Casing Diameter	Weight	Hole Diameter
12 in. To 85 ft.	lbs./ft.	18 in. To 120 ft.

Open Hole From ft. To ft.

Screen? ☒ **Type** stainless **Make** JOHNSON

Diameter	Slot/Gauze	Length	Set	
12 in.	45	15 ft.	85 ft.	100 ft.
12 in.	50	20 ft.	100 ft.	120 ft.

Static Water Level

Pumping Level (below land surface)

119 ft. 24 hrs. Pumping at 1000 g.p.m.

Wellhead Completion

Pitless adapter manufacturer Model

☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☒ Yes ☐ No ☐ Not Specified

Material	Amount	From	To
concrete		ft.	75 ft.

Nearest Known Source of Contamination

feet Direction Type

Well disinfected upon completion? ☐ Yes ☐ No

Pump ☒ Not Installed Date Installed

Manufacturer's name
Model Number HP Volt
Length of drop pipe ft Capacity g.p. Typ

Abandoned

Does property have any not in use and not sealed well(s)? ☐ Yes ☒ No

Variance

Was a variance granted from the MDH for this well? ☐ Yes ☒ No

Miscellaneous

First Bedrock Aquifer Quat. buried
Last Strat sand-gray Depth to Bedrock ft
Located by Minnesota Department of Health
Locate Method Digitization (Screen) - Map (1:24,000)
System UTM - NAD83, Zone 15, Meters X 316524 Y 5085447
Unique Number Verification Info/GPS from data Input Date 07/19/2010

Angled Drill Hole

Well Contractor

Steven M Traut Wells, Inc. 1889 SEE REMARKS
Licensee Business Lic. or Reg. No. Name of Driller

Minnesota Unique Well Number

762288

County Douglas
Quad Alexandria
Quad ID 180A

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING REPORT

Minnesota Statutes Chapter 1031

Entry Date 12/02/2008
Update Date 05/19/2016
Received Date 10/27/2008

Well Name	Township	Range	Dir	Section	Subsection
ALEXANDRIA 17	128	37	W	17	BCDBAC

Elevation 1400 **Elev. Method** Calc from NED (Natl.Elev.Dataset-30m)

Address

Contact 704 BROADWAY ALEXANDRIA MN 56308
Well 514 OAK ST N ALEXANDRIA MN 56308

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
DIRT	0	2	BLACK	
CLAY	2	19	YELLOW	
CLAY	19	37	BLUE	
SAND	37	38		
CLAY	38	44	BLUE	
SAND SEAM	44	45		
CLAY	45	60	BROWN	
SAND	60	61		
CLAY	61	86	BLUE	
SAND & GRAVEL	86	105		
SAND	105	131		
CLAY	131	140	BLUE	

Remarks

Well Depth 140 ft. **Depth Completed** 134.5 ft. **Date Well Completed** 09/02/2008

Drill Method Non-specified Rotary **Drill Fluid** Bentonite

Use community supply(municipal) **Status** Active

Well Hydrofractured? Yes ☐ No ☒ **From** 0 ft. **To**

Casing Type Single casing **Joint**
Drive Shoe? Yes ☐ No ☒ **Above/Below**

Casing Diameter	Weight	Hole Diameter
12 in. To 99.5 ft.	lbs./ft.	17. in. To ft.

Open Hole From ft. To ft.

Screen? ☒ **Type** stainless **Make** JOHNSON

Diameter	Slot/Gauze	Length	Set	
12 in.	60	35 ft.	99.5 ft.	134.5 ft.

Static Water Level
51.9 ft. land surface Measure 05/22/2008

Pumping Level (below land surface)
75.2 ft. 24 hrs. Pumping at 700 g.p.m.

Wellhead Completion
Pitless adapter manufacturer Model
☐ Casing Protection ☒ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☒ Yes ☐ No ☐ Not Specified

Material	Amount	From	To
neat cement	3.25 Cubic yards	ft.	90 ft.

Nearest Known Source of Contamination
50 feet Direction Sewer Type
Well disinfected upon completion? ☒ Yes ☐ No

Pump ☐ Not Installed Date Installed 08/25/2008
Manufacturer's name GOULDS
Model Number 10RJMC HP 25 Volt 230
Length of drop pipe 94.5 ft Capacity 500 g.p. Typ Turbine

Abandoned
Does property have any not in use and not sealed well(s)? ☐ Yes ☒ No

Variance
Was a variance granted from the MDH for this well? ☐ Yes ☒ No

Miscellaneous
First Bedrock Aquifer Quat. buried
Last Strat clay-gray Depth to Bedrock ft
Located by Minnesota Department of Health
Locate Method Digitization (Screen) - Map (1:24,000)
System UTM - NAD83, Zone 15, Meters X 316623 Y 5085432
Unique Number Verification Info/GPS from data Input Date 07/19/2010

Angled Drill Hole

Well Contractor
Thein Well Co., Inc. 1337 THEIN, R.
Licensee Business Lic. or Reg. No. Name of Driller

Minnesota Unique Well Number

791566

County Douglas
Quad Alexandria
Quad ID 180A

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING REPORT

Minnesota Statutes Chapter 1031

Entry Date 03/26/2013
Update Date 09/30/2016
Received Date 01/18/2013

Well Name	Township	Range	Dir	Section	Subsection
ALEXANDRIA 18	128	37	W	17	BCCDDD

Elevation 1404 **Elev. Method** LiDAR 1m DEM (MNDNR)

Address

Contact P.O. BOIX 609 ALEXANDRIA MN 56308
Well ALEXANDRIA MN 56308

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
TOP SOIL	0	2	BLACK	SOFT
CLAY	2	15	BROWN	MEDIUM
SAND & CLAY LAYERS	15	35	BROWN	MEDIUM
SAND	35	41	BROWN	MEDIUM
CLAY	41	52	GRAY	HARD
SAND	52	55	GRAY	MEDIUM
CLAY	55	58	GRAY	HARD
SAND	58	60	GRAY	MEDIUM
SANDY CLAY	60	81	GRAY	MEDIUM
SAND	81	110	GRAY	MEDIUM
FINE SAND	110	115	GRAY	SOFT
SAND	115	120	GRAY	MEDIUM

Remarks

IRON 2.5 HARD 16.
DRILLERS: STEVE, DEAN, RICH, TROY, & ROB.

Well Depth 120 ft. **Depth Completed** 120 ft. **Date Well Completed** 07/16/2012

Drill Method Non-specified Rotary **Drill Fluid** Other

Use community supply(municipal) **Status** Active

Well Hydrofractured? Yes ☐ No ☒ **From** **To**

Casing Type Single casing **Joint**
Drive Shoe? Yes ☐ No ☐ **Above/Below**

Casing Diameter	Weight	Hole Diameter
12 in. To 90 ft.	lbs./ft.	18 in. To 120 ft.

Open Hole From ft. To ft.

Screen? ☒ **Type** stainless **Make** JOHNSON

Diameter	Slot/Gauze	Length	Set	
12 in.	70	30 ft.	90 ft.	120 ft.

Static Water Level
54 ft. land surface Measure 07/16/2012

Pumping Level (below land surface)
90 ft. 24 hrs. Pumping at 600 g.p.m.

Wellhead Completion
Pitless adapter manufacturer Model
☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☒ Yes ☐ No ☐ Not Specified

Material	Amount	From	To
neat cement	7 Cubic yards	ft.	80 ft.

Nearest Known Source of Contamination
feet Direction Type
Well disinfected upon completion? ☒ Yes ☐ No

Pump ☐ Not Installed Date Installed 12/04/2012
Manufacturer's name GOULDS
Model Number 9RCHC HP 25 Volt 460
Length of drop pipe 85 ft Capacity 700 g.p. Typ Turbine

Abandoned
Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

Variance
Was a variance granted from the MDH for this well? ☐ Yes ☒ No

Miscellaneous
First Bedrock Aquifer Quat. buried
Last Strat sand-gray Depth to Bedrock ft
Located by Minnesota Department of Health
Locate Method GPS SA Off (averaged)
System UTM - NAD83, Zone 15, Meters X 316531 Y 5085297
Unique Number Verification Info/GPS from data Input Date 07/10/2012

Angled Drill Hole

Well Contractor
Steven M Traut Wells, Inc. 1889 SEE REMARKS
Licensee Business Lic. or Reg. No. Name of Driller

Minnesota Unique Well Number

810340

County Douglas
Quad Alexandria
Quad ID 180A

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING REPORT

Minnesota Statutes Chapter 1031

Entry Date
Update Date 01/09/2017
Received Date 11/19/2015

Well Name	Township	Range	Dir	Section	Subsection
ALEXANDRIA 19	128	37	W	17	CAACBB

Elevation 1394.4 **Elev. Method** LiDAR 1m DEM (MNDNR)

Address

Well AGNES AV ALEXANDRIA MN 56308
Contact 316 FILLMORE ST ALEXANDRIA MN 56308

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
TOP SOIL	0	1		
FILL	1	2		
ROCK	2	3		
CLAY	3	4	GRAY	
CLAY & GRAVEL	4	17		
SANDY CLAY	17	27	BROWN	
SANDY CLAY	27	38	GRAY	
CLAY	38	42	GREEN	
CLAY	42	49	GRAY	
ROCK	49	50		
SANDY CLAY	50	56	GRAY	
CLAY	56	68	GRAY	HARD
SILTY SAND	68	68		
CLAY W/SAND &	68	78	LT. GRY	
CLAY	78	84	GRAY	
SAND & GRAVEL	84	100		
SAND MED/FINE	100	104		
SAND & GRAVEL MED-	104	116		
CLAY	116	120	GRAY	

Remarks

Well Depth 120 ft. **Depth Completed** 116 ft. **Date Well Completed** 10/15/2015

Drill Method Non-specified Rotary **Drill Fluid** Bentonite

Use community supply(municipal) **Status** Active

Well Hydrofractured? Yes ☐ No ☒ **From** **To**

Casing Type Single casing **Joint**
Drive Shoe? Yes ☐ No ☒ **Above/Below**

Casing Diameter	Weight	Hole Diameter
12 in. To 86 ft.	lbs./ft.	26 in. To 20 ft.
24 in. To 20 ft.	lbs./ft.	17. in. To 116 ft.

Open Hole From ft. To ft.

Screen? ☒ **Type** stainless **Make** JOHNSON

Diameter	Slot/Gauze	Length	Set	
12 in.	60	30 ft.	88 ft.	116 ft.

Static Water Level
83 ft. land surface Measure 06/12/2015

Pumping Level (below land surface)
ft. 24 hrs. Pumping at 500 g.p.m.

Wellhead Completion
Pitless adapter manufacturer Model
☐ Casing Protection ☒ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☒ Yes ☐ No ☐ Not Specified

Material	Amount		From	To
neat cement	4	Cubic yards	ft.	80 ft.
neat cement	1	Cubic yards	ft.	20 ft.

Nearest Known Source of Contamination
50 feet Direction Sewer Type
Well disinfected upon completion? ☒ Yes ☐ No

Pump ☐ Not Installed Date Installed 10/15/2015
Manufacturer's name GOULDS
Model Number 9RCHC HP 25 Volt 230
Length of drop pipe 82 ft Capacity 500 g.p. Typ Turbine

Abandoned
Does property have any not in use and not sealed well(s)? ☐ Yes ☒ No

Variance
Was a variance granted from the MDH for this well? ☐ Yes ☒ No

Miscellaneous
First Bedrock Aquifer Quat. buried
Last Strat clay-gray Depth to Bedrock ft
Located by Minnesota Department of Health
Locate Method Digitization (Screen) - Map (1:24,000)
System UTM - NAD83, Zone 15, Meters X 316956 Y 5085143
Unique Number Verification Info/GPS from data Input Date 09/07/2016

Angled Drill Hole

Well Contractor
Thein Well Co., Inc. 1337 WINTHER, M.
Licensee Business Lic. or Reg. No. Name of Driller

Minnesota Unique Well Number

821203

County Douglas
Quad Alexandria
Quad ID 180A

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING REPORT

Minnesota Statutes Chapter 1031

Entry Date 10/07/2016
Update Date 12/06/2016
Received Date 09/19/2016

Well Name	Township	Range	Dir	Section	Subsection
ALEXANDRIA 20	128	37	W	17	BCDAAC

Elevation 1401 **Elev. Method** LiDAR 1m DEM (MNDNR)

Address

Contact 704 BROADWAY ST ALEXANDRIA MN 56308
Well PARK ST N ALEXANDRIA MN 56308

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
FILL	0	1		
CLAY	1	19	TAN	
GRAVEL	19	21		
CLAY	21	30	TAN	
CLAY	30	45	GRAY	
SAND AND SILT	45	46	TAN	
GRAVEL	46	54	DARK	
CLAY	54	67	GRAY	
SANDY SILTY CLAY	67	90	GRAY	
SAND AND GRAVEL	90	116		
MED TO FINE SAND	116	133		
CLAY	133	140	GRAY	

Remarks

Well Depth 140 ft. **Depth Completed** 133 ft. **Date Well Completed** 09/07/2016

Drill Method Non-specified Rotary **Drill Fluid** Bentonite

Use community supply(municipal) **Status** Active

Well Hydrofractured? Yes ☐ No ☒ **From** **To**

Casing Type Single casing **Joint**
Drive Shoe? Yes ☐ No ☒ **Above/Below**

Casing Diameter	Weight	Hole Diameter
12 in. To 92.5 ft.	lbs./ft.	17. in. To ft.

Open Hole From ft. To ft.

Screen? ☒ **Type** stainless **Make** JOHNSON

Diameter	Slot/Gauze	Length	Set	
12 in.	80	40.5 ft.	92.5 ft.	133 ft.

Static Water Level
55 ft. land surface Measure 07/18/2016

Pumping Level (below land surface)
80.3 ft. 24 hrs. Pumping at 700 g.p.m.

Wellhead Completion
Pitless adapter manufacturer BAKER Model
☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☒ Yes ☐ No ☐ Not Specified

Material	Amount	From	To
neat cement	8 Cubic yards	ft. 83	ft.

Nearest Known Source of Contamination
50 feet Direction Sewer Type
Well disinfected upon completion? ☒ Yes ☐ No

Pump ☐ Not Installed Date Installed 09/07/2016
Manufacturer's name GOULDS
Model Number 7TSLC HP 25 Volt 460
Length of drop pipe 79 ft Capacity 500 g.p. Typ Submersible

Abandoned
Does property have any not in use and not sealed well(s)? ☐ Yes ☒ No

Variance
Was a variance granted from the MDH for this well? ☐ Yes ☒ No

Miscellaneous
First Bedrock Aquifer Quat. buried
Last Strat clay-gray Depth to Bedrock ft
Located by Minnesota Department of Health
Locate Method GPS SA Off (averaged)
System UTM - NAD83, Zone 15, Meters X 316737 Y 5085434
Unique Number Verification Info/GPS from data Input Date 06/28/2016

Angled Drill Hole

Well Contractor
Thein Well Co., Inc. 1337 WINTHER, M
Licensee Business Lic. or Reg. No. Name of Driller

Appendix B

Table 1: Potential Sources Site Summary Table

Site Number*	Site Name	Site Address	Potential Environmental Concerns	Documented Chlorinated VOC Impacts		
				Soil	Groundwater	Soil Vapor
1	Habitat for Humanity Re-Store	1211 North Nokomis Street NE	Former auto service business			
2	Rob's Auto Body	1006 Robert Street NE	Auto service business			
3	Subway	903-905 North Nokomis Street NE	Former gasoline station; petroleum tank release site			
4	Holiday Stationstore	785 North Nokomis Street NE	Gasoline station			
5	Multi-Tenant Office Building	507 North Nokomis Street	Former gasoline station; petroleum tank release site			
6	Vacant Lot	301 North Nokomis Street	Former coin laundry facility			
7	Vacant Lot	302 North Nokomis Street	Former gasoline station; petroleum tank release site			
8	ReMax Lakes Area Realty	217 North Nokomis Street	Former gasoline station			
9	Trugreen	302 3rd Avenue West	Former engine service business and possible gasoline station			
10	Minnesota Lake Maritime Museum	205 3rd Avenue West	Former street department facility; petroleum tank release site			
11	Runestone Museum	206 Broadway Street	Former gasoline station and bulk petroleum storage facilities; petroleum tank release site			X
12	Downtown Liquor Store	214 Broadway Street	Former water/electric/light plant, boat works facility, gasoline station and bulk petroleum storage facility; petroleum tank release site		X	X
13	Counselor Realty	211 Broadway Street	Former monument works and gasoline station			
14	Multi-Tenant Office Building	123 3rd Avenue East	Former farm implement service; petroleum tank release site			
15	Goodwill	219 3rd Avenue East	Former gasoline/service station; petroleum tank release site; Petroleum Brownfield site			
16	DC Collision Center	202 Jefferson Street	Auto service businesses			
17	Vacant Lot	403 3rd Avenue East	Former gasoline station; petroleum tank release site			X
18	Hemming Motor Co.	423 3rd Avenue East	Former gasoline/service station; current auto service business; petroleum tank release site		X	
19	Thrifty White Pharmacy	519 3rd Avenue East	Former gasoline/service station and bulk petroleum storage facility; petroleum tank		X	

*Note: See Figure 3 for locations.

Potential Sources Site Summary Table
Phase I Investigation
Alexandria Well Field Contamination
Alexandria, Minnesota

Site Number*	Site Name	Site Address	Potential Environmental Concerns	Documented Chlorinated VOC Impacts		
				Soil	Groundwater	Soil Vapor
			release site			
20	Rocket Auto Electric	206 Lake Street	Former oil company; current auto service business			
21	Multi-Tenant Commercial Buildings	611-619 3rd Avenue East	Former auto service businesses and possible gasoline station			
22	Elden's Fresh Foods	707-717 3rd Avenue East	Former gasoline/service stations; petroleum tank release site			
23	SuperAmerica/Burger King and Tiremaxx Service Center/City Auto Glass	209-211 Nokomis Street and 801 3rd Avenue East	Former and current gasoline stations and auto service businesses; petroleum tank release site		**X**	**X**
24	Commercial Buildings	905 3rd Avenue East	Former auto service businesses; petroleum tank release site		**X**	**X**
25	Sinclair Gasoline Station	1109 3rd Avenue East	Gasoline station; petroleum tank release site			
26	Woodsmen Power Products	1209 3rd Avenue East	Former salvage business and current equipment service center			
27	Ferrellgas	1308-1312 3rd Avenue East	Former trucking and transport business			
28	Stoeckel Surveying	1206 3rd Avenue East	Former engine service business			
29	Precision Electronics	316-318 Roosevelt Street	Former body shop			
30	Tennessee Automotive Care & Repair	312 Quincy Street	Auto service business			
31	Vacant Asphalt-Paved Lot	1024 3rd Avenue East	Former auto body business			
32	Alex Recreation and Doherty Staffing Solutions	315 Nokomis Street	Former rental service; petroleum tank release site		**X**	
33	Ollie's Auto Sales	722 3rd Avenue East	Former gasoline station; current auto sales/service			
34	Wells Fargo Bank	304 Maple Street	Former gasoline/service stations; petroleum tank release site			
35	Holiday Stationstore	320 3rd Avenue East	Gasoline station; petroleum tank release site			**X**
36	Multi-Tenant Commercial Building	302-308 3rd Avenue East	Former gasoline station, paint and body shop, and cleaner			

*Note: See Figure 3 for locations.

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Potential Sources Site Summary Table
Phase I Investigation
Alexandria Well Field Contamination
Alexandria, Minnesota

Site Number*	Site Name	Site Address	Potential Environmental Concerns	Documented Chlorinated VOC Impacts		
				Soil	Groundwater	Soil Vapor
37	Multi-Tenant Retail Building	218 3rd Avenue East	Former bottling house, ice cream factory, and auto service business; petroleum tank release site			
38	Multi-Tenant Retail Building	118 3rd Avenue East	Former brewery and gasoline station			
39	West Central Glass & Air Conditioning	301 Broadway Street	Gasoline/service stations; petroleum tank release site		**X**	
40	Shutters Tire & Auto	302 Broadway Street	Former gasoline station; current auto service business			
41	U-Haul Storage Lot	110 3rd Avenue West	Former garage and shop			
42	Alexandria Light & Power	316 Fillmore Street and 223-225 4th Avenue West	Electric substation and city garages; petroleum tank release site			
43	Spectrum Printing and Countryside Heating & AC	316 Broadway Street	Petroleum tank release site			
44	Multi-Tenant Commercial Building	324 Broadway Street	Former brewery and tractor repair			
45	Carriage House	422 Broadway Street	Former steam launderer			
46	Legal Services Of Northwest Minnesota	426 Broadway Street	Former dry cleaner			
47	American Laundry & Cleaners	401 Broadway Street	Former cement block manufacturer; current dry cleaner			
48	Viking Pawn	403 Broadway Street	Former vulcanizing/tire shop and cleaner/launderer (storage)			
49	Bulebirdshopper.com and Larson Insurance	411, 413 and 415 Broadway Street	Former machine shop, auto service, and commercial garage			
50	Parking Lot	423 Broadway Street	Former gasoline station			
51	Bulk Petroleum Storage Facility	409 Nokomis Street	Bulk petroleum storage facility; petroleum tank release site			
52	Single-Family Dwelling	909 6th Avenue East	Former cleaner (a web search identified asite as a janitorial service)			

*Note: See Figure 3 for locations.

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Potential Sources Site Summary Table
Phase I Investigation
Alexandria Well Field Contamination
Alexandria, Minnesota

Site Number*	Site Name	Site Address	Potential Environmental Concerns	Documented Chlorinated VOC Impacts		
				Soil	Groundwater	Soil Vapor
53	Multi-Tenant Commercial Building	823 6th Avenue East	Former gasoline stations, bulk oil station and farm implement service; current auto service business			
54	Undeveloped portion of 515 Jefferson Street	515 Jefferson Street	Former bus repair garage			
55	Multi-Tenant Commercial Building	503 Hawthorne Street	Former repair shop; paints and oils; auto painting and service; and commercial garage			
56	Multi-Tenant Commercial Building	209-213 6th Avenue East	Former machine shop and auto service			
57	Masonic Lodge	205 6th Avenue East	Former commercial garage with storage tanks			
58	Commercial Building	203 6th Avenue East	Former flour and feed warehouse and auto service business			
59	Laraway Financial	201 6th Avenue East	Former auto garage/vulcanizing			
60	Martinson Insurance Building	121-123 6th Avenue East and 518 Hawthorne Street	Former commercial garage and auto sales and service			
61	Godfrey Chiropractic & Wellness	119 6th Avenue East	Former hotel laundry			
62	Common Ground Coffee House	516 Hawthorne Street	Former repair shop			
63	Parking Lot	Southwest corner of 5th Avenue East and Hawthorne Street	Former mineral water factory, garage/repair shop, and gasoline station			
64	Special Memories	110 5th Avenue East	Former auto service and vulcanizing			
65	Yesterday's	517 Broadway Street	Former commercial garage with storage tanks			
66	Multi-Tenant Commercial Building	502-504 Broadway Street and 110 and 114 5th Avenue West	Former gasoline station			
67	Parking Lot	East side of Fillmore Street between 5th and 6th Avenues West	Former gasoline station			
68	Ben Franklin Crafts	624 Broadway Street	Former cleaners/hatters			

*Note: See Figure 3 for locations.

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Potential Sources Site Summary Table
Phase I Investigation
Alexandria Well Field Contamination
Alexandria, Minnesota

Site Number*	Site Name	Site Address	Potential Environmental Concerns	Documented Chlorinated VOC Impacts		
				Soil	Groundwater	Soil Vapor
69	Parking Lot	Formerly 115 7th Avenue East	Former hatchery, creamery, and cleaners/hatters			
70	Multi-Tenant Commercial Building	614-616 Hawthorne Street	Former auto sales/service			
71	Koep's Korner and Alexandria Golf Carts	605 Hawthorne Street and 204 6th Avenue East	Former flour/feed mill, commercial garage, and gasoline station; petroleum tank release site		X	
72	Alexandria Appliance	222 6th Avenue East	Former service station			
73	Parking Lot	612 Irving Street	Former machine shop, motor rebuilder, and engine service business			
74	Alexandria Telephone Co.	611-617 Irving Street	Former machine shop and auto body shop			
75	Century Link	601 Irving Street	Former gasoline/service station			
76	Alex Transmission & Repair	601 Oak Street	Former gasoline station; current auto service business			
77	Former Censota Blenders	720 Oak Street	Former private garage with storage tank			
78	Hubbard Feeds	705 Nokomis Street	Feed mill/grain elevator; petroleum tank release site			
79	Multi-Tenant Commercial Building	720-724 Nokomis Street	Former foundry and machine shop; current auto service			
80	Commercial Building	719-721 8th Avenue East	Former garage with storage tank			
81	Auto Value	124 7th Avenue East	Former commercial garage with store tank			
82	Alexandria City Hall	704 Broadway Street	Former commercial garage with storage tank and auto sales/service			
83	Parking Lot	Formerly 715 Fillmore Street	Former cleaners/cleaning plant			
84	Bremer Bank	720 Broadway Street	Former brewery, flour mill, and gasoline station			
85	Parking Lot	817 Fillmore Street	Petroleum tank release site			
86	Ameriprise Financial	817 Broadway Street	Former auto service and gasoline station; petroleum tank release site			
87	Walgreens	910 Broadway Street	Former auto service business; petroleum tank		X	

*Note: See Figure 3 for locations.

Potential Sources Site Summary Table
Phase I Investigation
Alexandria Well Field Contamination
Alexandria, Minnesota

Site Number*	Site Name	Site Address	Potential Environmental Concerns	Documented Chlorinated VOC Impacts		
				Soil	Groundwater	Soil Vapor
			release site; inactive VIC site			
88	Single-Family Dwelling and Detached Garage	1021 Douglas Street	Former dry cleaner			
89	Cenex	1705 Broadway Street	Former and current gasoline station and/or auto service businesses; petroleum tank release site		**X**	**X**

Note:
Original Table prepared by Braun Intertec, 2016.
Table modified by MPCA 2018.

*Note: See Figure 3 for locations.

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September 28, 2018

Preliminary Assessment Report
Alexandria Municipal Well Contamination
Alexandria, Douglas County, Minnesota
MPCA Site Assessment Site SA247
EPA ID MNN000505797

MINNESOTA POLLUTION CONTROL AGENCY